INNOVATING FOR HEALTH

Patients, physicians, the pharmaceutical industry and the NHS

Report of a Working Party

February 2009

Royal College of Physicians
Setting higher medical standards

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The Royal College of Physicians

The Royal College of Physicians plays a leading role in the delivery of high quality patient care by setting standards of medical practice and promoting clinical excellence. We provide physicians in the United Kingdom and overseas with education, training and support throughout their careers. As an independent body representing over 20,000 Fellows and Members worldwide, we advise and work with government, the public, patients and other professions to improve health and healthcare.

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Foreword

Doctors and the pharmaceutical industry have a long and proud tradition of working together. Over the years, this partnership has resulted in a number of benefits, principally those of new drug discovery, better patient care and improved clinical outcomes. In the words of the joint declaration of the Standing Committee of European Doctors and the European Federation of Pharmaceutical Industries Associations:

> *Cooperation between the medical profession and the pharmaceutical industry is important and necessary at all stages of the development and use of medicines to secure safety of patients and efficacy of therapy.**

This statement is uncontroversial and it is clear that the need for solid collaboration is universal. But in the UK, changes to the regulatory environment, shifts in NHS priorities and various competitive forces from abroad mean that now, as never before, the partnership established between physicians, industry, academia and the NHS needs to be improved if the prominent place of the NHS in pharmaceutical industry research and development is to be sustained.

Meetings in 2005 between the Royal College of Physicians and pharmaceutical industry representatives identified several factors critical to the future of the pharmaceutical industry and to pharmaceutical research in the UK. Among other things, these included the need to create new partnerships between industry, academia, clinicians and the public, the need to improve engagement in 'grass roots' pharmaceutical research, and the need to address education and training issues at medical student and junior doctor level. In an attempt to confront these and associated matters more formally, in September 2007 the College convened a Working Party with a remit to review partnerships with industry, with the overriding intention of defining the conditions in which safe and effective medicines can be developed and delivered for the benefit of patients.

This report contains 42 recommendations on patient care, professional education, research, culture and relationships. It is not for the profession alone, and each aspect is addressed to a wide constituency. The intention is that the recommendations contained in the report will enable clinicians, academia, industry and the national agencies that the Working Party believes have an essential part to play in influencing the steps necessary to build on the already excellent foundation of previous years, to go forward to create a climate of trust and cooperation that transcends the interests of any one party.

In undertaking this review, the Working Party is particularly indebted to the College's Patient and Carer Network for providing valuable insight into the realities of taking prescribed medicines on a regular as well as an occasional basis – it is the end point of better patient care and experience to which all our endeavours for improvement and excellence must be directed.

February 2009

Ian Gilmore
President, Royal College of Physicians

*Standing Committee of European Doctors and the European Federation of Pharmaceutical Industries Associations. *Cooperation between the medical profession and the pharmaceutical industry*. Joint declaration of the CPME and EFPIA, June 2005. http://212.3.246.100/Objects/2/Files/EFPIACPMEJointdeclaration.pdf

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This report reflects the consensus of the Working Party, but not necessarily those of the Government or Government officials who offered views in the process.

Acknowledgements

The ideas that shaped this Working Party's conclusions were greatly influenced by the oral and written evidence we received (see Appendices 1 and 2), together with the results of a survey of the Royal College of Physicians Patient and Carer Network. The Working Party wishes to thank all those who have given their time in providing oral and written evidence. We also thank Derek Calam for organising the Patient and Carer Network survey.

We are deeply grateful to Peter Stephens from IMS Health for his financial support.

The chair of the Working Party owes a special debt of gratitude to the following individuals: Professor Ian Gilmore, for initiating and enthusiastically encouraging the Working Party throughout its course; Dr Susan Shepherd, for her unremitting commitment to the group's work and her extraordinary skill in organising the huge volume of evidence we received; Professor Dame Carol Black, for organising two critical seminars between academic and NHS leaders and industry executives; Dr David Gillen, for facilitating an extremely informative site visit and meetings at Pfizer's Sandwich research facility; Mr Dick Lock, for recording evidence sessions; Mrs Hopelyn Goodwin, for typing the final report; and Dr Ingrid and Ms Isobel Horton, for allowing generous time for this report to be written and revised.

Gathering the evidence

In order to gather data to inform the writing of this report, the Working Party adopted a comprehensive method of consultation, beginning in September 2007 and ending in November 2008. During this time, the Working Party took oral evidence from 17 witnesses; received over 70 written responses to a set of questions about the NHS, pharmaceutical industry and academic medicine; commissioned a survey from the Royal College of Physicians Patient and Carer Network; drew on extensive peer-reviewed literature; and took additional soundings from a broad range of opinion leaders, including meetings hosted by the Academy of Medical Royal Colleges with UK pharmaceutical industry leaders, and the American Pharmaceutical Group (UK affiliates of major US companies). The findings of the Working Party were reported and tested against the views of over 50 experts in September 2008.

Throughout this report, selected quotations from the Working Party's witnesses illustrate and amplify the points made and conclusions drawn.

The Working Party has made every effort to ensure that its conclusions are informed by the best available evidence.

Terms of reference of the Working Party

Objectives

To review the current and future conditions for, and barriers to, a dynamic, productive and sustainable relationship between the NHS, academic medicine and the pharmaceutical industry – the purpose of which is to discover and deliver safe, effective and affordable new medicines to patients based on need.

To identify policies that would promote such a relationship.

To define the role of the Royal College of Physicians in advancing and strengthening this relationship.

Tasks

To obtain evidence about the current and future prospects for the pharmaceutical industry.

To obtain evidence about the contribution doctors can make to a successful alliance between the pharmaceutical industry and medicine.

To obtain evidence of successes and failures in the relationship between the NHS, academic medicine and the pharmaceutical industry.

To seek evidence from other high income countries that might be relevant to the UK.

Executive summary

Medicines and medicine are inextricably connected. Today, the NHS, academic medicine and the pharmaceutical industry have a symbiotic relationship. Each depends on the others for success. And there have been enormous successes clinically, scientifically and economically. However, in recent years, diverse critics in the medical profession, politics and the media have questioned the strength and integrity of these relationships.

The concept that links all three entities is innovation: creating new ideas and new medicines, translating and implementing research findings, and finding new ways of working to enhance patient care, patient outcomes and patient satisfaction. At a local level throughout much of the NHS, the relationships needed to deliver innovation are badly damaged, even broken in some instances. This Working Party aimed to draw a line under past confrontational debates. We wanted to redefine the terms of engagement between the NHS, academic medicine and the pharmaceutical industry; to set out the conditions necessary for a flourishing culture between these sectors, with the health and well-being of the patient as the overriding objective.

A survey of the Royal College of Physicians Patient and Carer Network revealed anxieties about the nexus between the NHS, research and industry, specifically concerning access to the most effective medicines, access to information about those medicines, the independence of doctors who make prescribing decisions, problems with adherence to medications, adverse drug reactions and participation in clinical trials. The funding of patient organisations by industry can convey the impression that these organisations are biased. A more patient-centred culture in devising medicines policy could deliver substantial gains in access, information, independence, adherence, safety and inclusion in trials.

Education is one of the most contentious areas between doctors, scientists and industry. Respected physicians at home and abroad have attacked pharmaceutical companies for using educational initiatives as promotional tools. It is also clear that medical schools are often not adequately preparing new doctors for prescribing. A stronger and more consistent undergraduate curriculum could do much to improve prescribing knowledge, understanding, skills and attitudes. Students also need to be protected from undue pharmaceutical marketing. Many of the same issues pertain to doctors in training. Continuing professional development programmes are too dependent on industry support. Royal colleges and faculties, together with NHS institutions, need to rethink their role in postgraduate education. Industry and its institutions must work harder to disseminate and enforce the Association of the British Pharmaceutical Industry (ABPI) Code of Practice. Meanwhile, all parties need to strive to find an acceptable way for the pharmaceutical industry to contribute to medical education. Doctors too must take greater financial responsibility for their own postgraduate education.

This is a highly significant moment for clinical research. There is more investment, stronger scientific leadership and greater political will behind biomedical research than at any time in recent history. But the Working Party received evidence suggesting that the UK research community has serious gaps – a lack of well qualified science graduates, deficiencies in *in vivo*

research skills and weaknesses in sustaining clinical trials. Part of the difficulty has been the weak incentive system in the NHS to support research. Collaboration between the private and public sectors has been fragmented. The NHS needs more muscular research leadership – clinically and managerially – together with a better alignment of incentives to promote and sustain research and research careers.

The key to the future is culture. Innovation is vital for the future of patient care. But respected observers are challenging contemporary models of innovation. And loss of trust in industry seems endemic. Trust has to be restored if progress is to be made in harnessing the best of industry, academia and the NHS. The Faculty of Pharmaceutical Medicine, together with a new generation of clinical pharmacologists and an enhanced clinical role for pharmacists, will play a critical part in this new covenant. And government initiatives, such as Ara Darzi's *Next stage review*, aim to put innovation at the heart of NHS reform. The Royal College of Physicians has an essential role in accelerating change.

We are optimistic about the future relationships between the NHS, academia and industry. Transparency and communication can promote a more strategic exchange of ideas. Doctors' leaders must speak up more forcefully for the advantages (to the patient) of greater intersectoral collaboration. Industry too must step up its public leadership. The strengthening of these voices is necessary if the overlapping sectors are to adapt to rapidly changing burdens of disease and patient expectations. Meanwhile, increasing prescribing volumes and costs are having a significant and growing impact on NHS strategy – for example, through the work of the National Institute for Health and Clinical Excellence (NICE).

The Royal College of Physicians has an important convening and catalytic role in rewriting the covenant between the NHS, academia and industry. The ultimate prize is great: an improved and sustainable future for patient care. The Working Party has set out 42 recommendations to turn this hope into a reality.

1 Introduction

1.1 Medicines are almost as old as medicine itself. The respected historian Owsei Temkin has traced therapeutics back to a Sumarian clay tablet dated 2100 BC.[1] Drugs were considered magical as well as physiological. They held mystical properties of healing, conferring a god-like status on the prescribing or dispensing physician. By the time of the Renaissance, writing recipes for potions had given way to experimental medicine. Rigorous scientific method had killed imaginative Galenic theory. But the possession of special knowledge about drugs remained a defining characteristic of the doctor. The birth of pharmacology in the 19th century put rational drug therapy on a firmer scientific footing. It also created a cadre of doctors – the first pharmaceutical physicians – who separated themselves from healing to support a new and powerful science.

> '…industry is producing medicines, and for that we are very grateful…'
>
> Joe Collier (5 December 2007)

1.2 At this time, apothecaries such as Merck and Schering began to mass produce drugs and sell them in pharmacies. In the UK, Allen and Hanbury created a successful London-based import-export business in medicines.[2] By the late 19th century, this early pharmaceutical industry was already provoking anxiety among critics concerned about the effects this new business would have on an unsuspecting public. One sceptic complained that, 'If an industrialist is but shrewd enough to advertise sufficiently, he usually succeeds in increasing the sale of his product – for some time at least – and thus enriching himself.'[1] This warning was written in 1876. It prefigured a century of anguish about the role of the pharmaceutical industry in patient care and research, and questions about the optimum quantity of medicines a patient should be taking – concerns that persist to this day.

1.3 What no one can doubt is that the pharmaceutical industry has been a vital force in the growth of healthcare as a major and successful sector within industrialised societies. Throughout the second half of the 20th century, research-based pharmaceutical companies were centres of remarkable innovation: discovering, developing and delivering new medicines to treat common conditions affecting patients, mostly, but not exclusively, in the western world. Pharmaceutical research and development departments contributed to, and benefited from, the enormous and rapid expansion in pathophysiological understanding of human disease. Constructive relationships grew up between university centres of medical research and pharmaceutical research departments. A 'ceaseless growth of specialists' provided a ready demand and market for the products of these new collaborations.[3] And some medical historians, such as Roy Porter, have argued that these alliances contributed to the dramatic escalation in health expenditure as a proportion of gross domestic product (GDP) in high income countries between the 1970s and the 1990s.[3] One might predict that, with the enthusiasm of industry for a new era of preventive technologies, in high income countries these pressures will only grow. In addition, there is a strong view among some commentators that medicines are not an inevitable good and that we need more policy discussion about the optimum level of medicines use.

> 'In the UK, we are in a unique position. The industry has developed a good reputation – there is more transparency and trust than we acknowledge and we should build on this. The contribution of the industry in terms of the wealth of UK plc (second only to the City of London) is enormous. But it is our contribution to science that is the most important. Looking at the UK over the last 10 to 15 years: 20% of the drugs have been discovered in the UK, we still manage to attract 10% of global research and development to the UK, and we are only 3–4% of the global market. I think there are lots of things to be proud of – we are not good at showing this.'
>
> Nigel Brooksby (20 February 2008)

1.4 In the UK, total government spending on health is around £120 billion each year, £104 billion of which is spent on the NHS (NHS 2006 figures). This expenditure translates into 9.4% of UK GDP, compared with 4.5% in 1970. (For comparison, US expenditure on health was 7.4% of GDP in 1970 and rose to 15.3% by 2004.) According to the Association of the British Pharmaceutical Industry (ABPI), 834 million prescriptions are dispensed annually (about 14 items for every person in the UK). The total cost of these medicines is £10.6 billion – 12.7% of total NHS spending or 0.9% of UK GDP. The ABPI points out that although this is a large sum, the UK is by no means the highest spender on drugs. Of 15 leading countries in the Organisation for Economic Cooperation and Development (OECD), the UK ranks 13th in pharmaceutical expenditure per head. The USA, France, Iceland, Switzerland, Japan, Italy, Canada, Germany, Norway, Luxembourg, Austria and Sweden all spend more on drugs per person than the UK.

1.5 The ABPI argues that medicines have saved the NHS billions of pounds. They point out that the average length of stay in an NHS hospital was 45 days in 1951, 19 days in 1980, and 4.7 days in 2007. For 12 major disease areas, they claim that the number of bed days has fallen from 70 billion in 1957 to 9.3 billion today. Although some would argue that the fall in bed days has not been entirely beneficial to patients, the ABPI estimates that the net savings to the NHS from this decline, which they say is at least partly due to the use of modern medicines, is almost £14 billion.

1.6 Pharmaceuticals are a global business. Compared with 2006, international sales of prescription drugs grew by 6.4% to $712 billion in 2007. Between 2002 and 2007 alone international sales rose by 33% ($178 billion). While the USA still has the largest single market (worth $287 billion in 2007), its proportionate contribution is declining as Asian markets in particular are growing at double digit rates. Sales in China and India, for example, grew by 26% and 13% respectively in 2007. European markets were the most sluggish. The five biggest European markets – the UK, Germany, France, Italy, and Spain – grew only 4.8% in 2007.[4] However, despite representing only 3% of the world market, the UK pharmaceutical sector generated a positive $4.3 billion trade balance in 2007.[5]

1.7 The popular portrayal of the pharmaceutical industry, in books such as *The billion dollar battle: Merck v Glaxo,*[6] for example, is often of a sector engaged in a race of discovery and innovation. A drama in which scientists are pioneering heroes while business executives fight for market share. There is some truth to this perception. In a recent survey of 1,250 global companies published by the Department for Innovation, Universities and Skills, the pharmaceutical industry outstripped all other sectors for research and development in 2007. [7] Of all global research and development, 19.4% occurs in the pharmaceutical and biotechnology sectors, beating technology hardware (17.7%), automotive enterprises (16.8%), electronics (7.4%) and computer software (7.2%). The

top 25 research spenders include seven pharmaceutical companies: Pfizer, Johnson & Johnson, GlaxoSmithKline, Sanofi-Aventis, Roche, Novartis and Merck (Table 1). Potentially, this investment should deliver huge benefits for patients.

Table 1 Pharmaceutical research and development in 2007.

Company	Research and development spend (£ billion)	Spending increase since 2006 (%)	Spending as percentage of sales (%)	Spending as percentage of profit (%)
Pfizer	3.88	2	14.5	57
Johnson & Johnson	3.64	13	13.4	52
GlaxoSmithKline	3.46	10	14.9	44
Sanofi-Aventis	2.97	9	15.5	93
Roche	2.76	15	15.7	56
Novartis	2.74	11	14.5	65
Merck	2.44	24	21.1	82
AstraZeneca	1.99	15	14.7	48
Amgen	1.72	45	23.6	88
Lilly	1.59	3	19.9	92
Wyeth	1.59	13	15.3	57
Bristol-Myers Squibb	1.57	12	17.1	115
Abbott	1.15	24	10	87
Schering-Plough	1.12	17	20.7	158
Boehringer Ingelheim	1.06	16	14.9	73

Reproduced with permission from Mills J. Pharma R and D fuels the global economy. *Scrip* 2 April 2008:25–6. www.scripnews.com[7]

1.8 But the tide in favour of the pharmaceutical industry and its role in medicine and medical research is turning. Powerful voices in medicine have raised doubts about the probity and activities of the drug industry – 'America's other drug problem', as two former editors of the *New England Journal of Medicine* put it.[8] The charges against the industry are serious and far-reaching: that pharmaceutical companies distort medicine and politics; drive up the costs of drugs unnecessarily; exaggerate the investments needed to discover and develop new medicines; overstate their contributions to innovation; commercialise clinical trials and healthcare to the disadvantage of patients and the public; use marketing to manipulate science; and lobby governments for their own private interests. Relman and Angell conclude, in a specifically American context:

> *The pharmaceutical industry dominates just about every aspect of the American healthcare system that is related to its business interests. It uses its wealth and its political clout to influence all who might check or monitor its activities – including physicians, professional*

> *and academic institutions, Congress, and the FDA. Hiding behind a screen of public relations and advertising, it expects consumers to sit still for its excesses, with the clearly implied threat that otherwise it will be forced to stop producing its medical miracles….*
>
> *Prescription drugs are an essential part of modern medical care. Americans need good new drugs at reasonable prices. Yet the pharmaceutical industry is failing to meet that need. There is a widening gap between its rhetoric and its practices. Neither the medical profession nor government has so far done much to remedy the situation, but sooner or later they will have to act… the consequences of continuing to allow an essential industry to put profits above the public interest are simply too grave.*[8]

Angell has continued her campaign against what she sees as the deceit and adverse influence of the pharmaceutical industry in public life.[9–11] And she has been joined by others who share and echo her views.[12]

> 'I do not blame industry for trying to get away with anything that is normally considered to be its primary purpose, which is to make profits and to look after its shareholders' interests. It is our profession that has colluded in all of this and been prepared to go along with it – we are the people to blame because we need not have stood for it.'
>
> Iain Chalmers (9 January 2008)

1.9 The UK has seen a similar drift towards a sceptical view of the pharmaceutical industry's influence in society. In 2003, the *British Medical Journal* published a theme issue entitled, 'Time to untangle doctors from drug companies'. The cover showed doctors as pigs playing golf and eating at the table of reptilian pharmaceutical company executives. But the editors of the *BMJ* were making a point that went well beyond a criticism of what they called 'food, flattery and friendship'. The journal published research showing that studies sponsored by drug companies were more likely to report outcomes that favoured the sponsor than comparable studies not funded by that sponsor.[13] Bias in sponsored research seemed to be endemic. The research showed that companies also appeared to use multiple publication, selective publication and selective reporting in medical journals to strengthen their marketing messages at the expense of reliable science.[14] And general practitioners (GPs) who admitted to weekly contact with drug representatives were shown to express views that led to more unnecessary prescribing than GPs who reported less frequent contact.[15] Doctors were too easily swayed by pharmaceutical marketing. In sum, there seemed to be several reasons for concern about the influence industry was having on both the integrity of the published science base of medicine and the independent judgments of prescribing doctors.

1.10 The peak of public criticism about the influence of the pharmaceutical industry on the health of the nation came in 2005 with publication of the House of Commons Health Select Committee report.[16] The committee expressed alarm about the 'disadvantages in the increasing use of and reliance on medicines'. They emphasised that the interests of the public, the NHS and industry 'often overlap but they are not identical'. The regulatory system that was supposed to ensure that industry worked in the public interest was 'failing', they said. The Department of Health (DH) had been too optimistic about the contribution industry made to health. They concluded that the industry had been 'lax' in its oversight. Companies had been allowed to suppress negative findings, design biased clinical trials and use marketing to infect medical education.

1.11 But the Select Committee's targets went beyond industry. MPs criticised the Medicines and Healthcare products Regulatory Agency (MHRA) for failing to scrutinise licensing data more critically and for having weak systems of post-marketing surveillance. The MHRA was 'too close to the industry', according to MPs. Worse still, doctors had allowed themselves to be manipulated by pharmaceutical companies. They had too often been willing participants in an unhealthy dependence on industry for hospitality and gifts. The government, meanwhile, had turned a blind eye to these worrying practices.

> 'I think this is an industry in free-fall at the present time… there is a lot of uncertainty for investors around patent protection and around drug pricing [and] uncertainties about their ability to innovate.'
>
> John Bell (30 April 2008)

1.12 Such criticisms – professional and political – continue, and are taking place against a background of important and often painful change across the pharmaceutical sector. 'The clouds have darkened over Big Pharma,' wrote the *Economist* in 2007.[17] Share prices are flat. Future profitability is predicted to be poor. Jobs are being cut worldwide. (Pfizer began to axe 10,000 of its workforce in 2007 while Novartis has announced 2,500 job losses by 2010.) A stronger generics industry is squeezing the revenues of some of the largest drugs manufacturers – over 80% of all prescription items were generic in England between 1997 and 2007. Returns on research and development seem to be softening. Too few new drugs are refilling industry's emptying pipeline. The public reputation of the pharmaceutical industry is damaged. The era of the blockbuster – drugs with annual sales of over $1 billion – looks to be ending. And the impact of a spate of patent expirations over the next five years will rock the industry like never before. Pfizer alone will lose $13 billion in revenue when the patent for Lipitor (atorvastatin) expires in the UK in 2011. Pharma executives talk of new business models, internal reorganisations, new leadership, outsourcing, rethinking all assumptions, novel collaborations and acquisitions, and diversifying into diagnostics, generics, biotechnology and devices. PricewaterhouseCoopers concludes that the 'core problem' facing the pharmaceutical industry is a 'lack of productivity in the lab'.[18]

> 'Today there are very few major blockbuster drugs being developed. The current drugs that are going through the pipeline for approval tend to be for smaller patient groups, addressing more specific needs and therefore the volume of sales protected by their patents is going to be proportionally lower over time.'
>
> David Cooksey (23 April 2008)

1.13 Specific examples illustrate the extent of the predicament for pharmaceutical companies and their relationships with the NHS and patients in the UK. In March 2008, the MHRA concluded a four-year investigation into GlaxoSmithKline, the UK's largest and most successful drug company, and the safety of its anti-depressant drug Seroxat. The inquiry was the largest of its kind in the UK, involving the scrutiny of over a million pages of evidence. The MHRA's main concern was to establish whether the company had failed to report information on the safety of Seroxat for under 18s early enough. In publishing their findings, the chief executive of the MHRA, Kent Woods, said, 'I remain concerned that GSK could and should have reported this information earlier than they did.'[19] The investigation revealed weaknesses in legislation requiring companies to inform the regulator about safety data when a drug was being used or tested outside its licensed

indication. These concerns were closely tied to anxieties about the non-publication of safety data from clinical trials, including those of selective-serotonin-reuptake inhibitors in childhood depression.[20] Despite GlaxoSmithKline's assurance that the company had acted properly and responsibly in disclosing information, the results of the MHRA investigation led government ministers to promise to strengthen laws on release of safety data. GlaxoSmithKline came under heavy public criticism.[21,22]

1.14 When safety concerns about GlaxoSmithKline's anti-diabetes drug, Avandia, were reported, the company's then chief executive, Jean-Pierre Garnier, blamed the media for igniting debates about drug safety before scientists had time to give their professional opinion.[23] He went on to issue a warning that 'other countries are trying to attract our best jobs', implying that GlaxoSmithKline could easily move employment and investment out of the UK if the environment was not favourable to the company.[24] This series of disputes and threats created an impression of an industry uneasy about its current place in UK society, an industry that feels government and the public fail to appreciate its contribution to the public's health, an industry perhaps unwanted as well as unloved.

1.15 The UK's second largest pharmaceutical company, AstraZeneca, has been reportedly hit by a string of pipeline failures,[25] together with anxieties about the safety of both old and newer medicines.[26,27] AstraZeneca is seeking to secure its long-term strength by cutting costs.[28] Powerful investors are publicly questioning the company's overall strategy for designing and producing new medicines.[29] Almost all large research-based pharmaceutical companies are facing similar challenges.[30]

1.16 As an industry contributing to patient care within the NHS, pharmaceutical companies have been attacked on even broader fronts. The British Generic Manufacturing Association is concerned about 'evergreening', the practice of pharmaceutical companies creating ways to prevent cheaper generic versions of drugs becoming available to NHS patients.[31] Advocates of a more evidence-informed approach to medicine, such as Iain Chalmers, point to industry-related publication bias in scientific research.[32] Medical journals continue to raise questions about the sustainability of drug discovery.[33] The European Union has launched dawn raids on companies to investigate whether they are keeping prices of branded medicines high or delaying access to cheaper generic alternatives.[34] US regulators are toughening their licensing practices, thereby delaying the launches of new medicines. And Oxfam initiated a fierce attack on pharmaceutical companies for neglecting research into diseases of poverty, failing to operate transparent pricing policies, and rigidly applying intellectual property rules that, it says, damage the health of those living in low income countries.[35]

1.17 Chief executives of pharmaceutical companies reject this wide array of criticism. They argue that they take their responsibilities to society seriously. They do not claim to have all the answers to the challenges thrown at them, but they are committed to working with others to find those answers. Multinational companies have a primary responsibility to their constituencies: their customers, shareholders, employees, suppliers, and the communities in which they operate. Many pharmaceutical companies clearly play a substantial part in public affairs. But companies will also point out, justifiably, that the welfare of people in any country remains the primary responsibility of government, not private industry. Partnerships between the private sector and government, together with the NHS, the academic community and non-governmental organisations, can be extremely helpful to treat the national burden of disease, solve healthcare

problems, raise awareness of neglected health issues, and create further funds for those who are most in need. Pharmaceutical companies should contribute wherever possible, chief executives would say, but they should remain focused on fulfilling their purpose and mission to achieve long-term success.

1.18 Several prevailing orthodoxies about the pharmaceutical industry may also be seriously mistaken. For example, it is commonly believed that pharmaceutical innovation is in decline. But a long-term analysis of trends in research and development suggests the opposite conclusion.[36] Esther Schmid and Dennis Smith have shown a steady, if fluctuating, increase in new drug approvals since 1945. They argue that, 'A myopic focus on near-term performance has set a myth in motion, which bears no relationship to the true innovation rates of the pharmaceutical industry.'[36] Figures provided to the Working Party by the ABPI support this contention. In 2002, there were 3,267 drugs in preclinical development, rising to 3,927 in 2007. And in 2002, there were 404 drugs in phase III trials, rising to 485 by 2007. The same upward trends can be seen for phase I, phase II and post-registration phases of drug development. Although it is also true to say that many of these drugs do not have the same financial value for industry as blockbusters once did, surveys of pipeline data reveal strong development portfolios for cancer and neurological diseases in particular.[37]

> 'I think there needs to be a culture change right across the board – the NHS, industry, the professions, particularly academia – and we need to get across the idea that collaborating with industry is actually an honourable thing to do.'
>
> Michael Rawlins (9 January 2008)

1.19 The drug industry wants to be seen to be acting as a responsible corporate citizen. It wants to rehabilitate its reputation. And it wants to win back the respect of its partners, not least the public. The industry seeks to act in a manner that is sustainable – economically, socially and environmentally. These elements are essential to its long-term results. Globally, patient-assistance programmes, expanded access schemes and drug donation projects are all designed to improve the availability of medicines based on need and not ability to pay. Companies increasingly recognise their global responsibilities and work with agencies such as the World Health Organization (WHO) to supply drugs at low cost to the countries that need them most. More commercial research and development money is now flowing into neglected tropical diseases. And new partnerships are being created to develop and deliver medicines to those least able to afford them.[38]

1.20 The idea at the heart of industry's relationship with the NHS and wider society is innovation: to create new ideas, new medicines and new ways of working. The responsibility of all participants in the health sector is to foster an environment in which creativity and innovation flourish for public and patient benefit. The pharmaceutical sector argues passionately that stability is essential to the success of the research-based pharmaceutical industry. Industry needs to be sure of its long-term expectations – politically and economically. It is essential that the government provides that framework of stability. This demand partly explains why 75% of over 100 pharmaceutical companies surveyed by the Confederation of British Industry and the ABPI in March 2008 reported that they were 'not very' or 'not at all' confident about the current UK pharmaceutical market environment.[39] Asked about the following twelve months, 83% of companies thought this environment would deteriorate, and only 1% thought it would improve.

One third of companies reported that they would be likely to reduce their UK investment in research and development and reduce their number of employees. Almost half of respondents expected to cut the number of clinical trials in the UK and 97% believed they were operating in an environment of increasing uncertainty. What is absolutely and alarmingly clear is that the pharmaceutical industry is not confident at all about its future in the UK. It is not confident about its commitment to clinical research. And it is not confident about the part it can play in working in partnership with the NHS to optimise patient care. The ongoing global financial crisis in 2008 and 2009 is only exacerbating these anxieties. It is fair to conclude that in many places the relationship between the NHS, academic medicine and the pharmaceutical industry is broken. A central task of the Working Party was to address these badly damaged relationships to identify what might be repaired and strengthened.

> 'I do not think we have ever had it so good in the UK.'
>
> Robert Lechler (23 April 2008)

1.21 The Royal College of Physicians (RCP) Working Party met representatives from the largest pharmaceutical companies in the UK on several occasions. The messages we heard were clear and stark. There had been a palpable fracture in the relationship between industry and medicine in recent years. The government's decision to reopen negotiations on the Pharmaceutical Price Regulation Scheme (PPRS) in the middle of an existing five-year agreement, following a critical 2007 Office of Fair Trading report, created unwanted instability for companies deciding where to locate future research investments. The UK's competitive advantage in clinical research has been lost, partly because other countries (Russia, Poland, India, China, Turkey) have caught up with the UK, and partly because the UK has created an often adversely bureaucratic (slow, expensive and unreliable) environment to conduct research. In written evidence provided by GlaxoSmithKline, for example, we were told that the NHS and academia remained 'ambivalent' towards working with industry. Clinicians too often displayed 'suspicion' about industry activities. Phase II and III clinical trials were viewed as inferior to other fields of academic research. 'The UK's performance in industry trials is generally poor,' they said. While GlaxoSmithKline conceded 'poor industry behaviour in the past…[which] reflects badly on the industry as a whole', they argued that 'a lack of meaningful strategic dialogue' between industry, academia and the NHS prevented the kind of fruitful relationships that would achieve advances in patient care.

1.22 In oral evidence, David Cooksey, the architect of the UK's upgraded and expanded political commitment to science, reported bleak news:

> *In Britain in 2002, the number of biotechnology companies being financed, and the average amount by which they were being financed, demonstrated that we were the outstanding leader in Europe; but by 2007, we were at the bottom of the pile in northern Europe... that is a real signal about what investors think the long-term future of this industry is going to be. That message has to be transmitted to government very clearly.*

1.23 This Working Party wanted to learn from past successes and failures in the relationships between the NHS, academic medicine and industry. We wanted to draw a line under the often fractious and confrontational debates between those parties. We wanted to discover whether we could write a new covenant between doctors and industry, between the NHS and the pharmaceutical sector, and between researchers in academic and industrial settings.[40] We wanted to redefine the terms of engagement between industry, the NHS and academia to deliver greater

value to the patient. To some observers, these objectives will seem idealistic rather than realistic. In written evidence, the British Medical Association pointed to a climate of suspicion, mistrust and prejudice that pervaded these relationships. The Royal College of General Practitioners argued that, 'There is a perception amongst professionals and the public that the pharmaceutical industry's drive for profit has overridden considerations of honesty, openness, and cost-effectiveness.' Individual physicians wrote to the Working Party to express their concern that the RCP was embarking on this work at all. We were warned that industry might 'see the present exercise as another way to achieve their promotional ends'.

> 'Disinterested but informed parties, such as the royal colleges and the MHRA, have a privileged position to raise the level of public debate and understanding around medicines development.'
>
> Kent Woods (12 March 2008)

1.24 Other contributors to the Working Party's deliberations took a more hopeful view. And, indeed, we had much to build on. The government's Ministerial Industry Strategy Group (MISG) had already identified the need for more effective partnerships between the NHS and industry. The Faculty of Pharmaceutical Medicine emphasised the widely shared principles of common goals, mutual respect, trust and transparency. And Cancer Research UK stressed the importance of all parties working together to maximise patient benefit. While recognising the weight of past scepticism and concern about seeking positive collaborations between the NHS, industry and academic medicine, the Working Party began and ended its work with the view that a flourishing and virtuous set of relationships could be created, provided that the primary end-point of those relationships was always kept firmly in mind: the health and well-being of the patient.

2 Patient care

2.1 Patients, and their doctors, face a paradox. On the one hand, they learn weekly of new findings, usually reported in randomised clinical trials published by medical journals, describing advances in drug therapy for common diseases. On the other hand, they may read the views of respected commentators who portray the armamentarium of drugs available to doctors as little more than agents of potential high risk to human health. Books such as *The power to harm*,[41] *Prescription for disaster*,[42] and *More harm than good*[43] all suggest that doctors are concealing hidden dangers about the drugs they are prescribing. Worse, patients are regularly regaled with stories about how drug companies exploit the public, like childhood bullies, with an attitude of, 'Who's going to stop me anyway?'[44]

> 'Consumers clearly see doctors as their preferred source of help and authority around prescription medicines.'
>
> Kate Webb (2 April 2008)

2.2 What few contributors to this debate are able to do is consult patients directly about their attitudes and behaviours towards medicines. The RCP is fortunate to have a Patient and Carer Network to advise it on a range of matters relevant to clinical practice. The Network includes individuals with many different chronic conditions. The Working Party sought their views about prescription drugs, the NHS, research and the pharmaceutical industry. Their observations – impressionistic and based on a small sample, yet extremely revealing – give a valuable insight into major domains of patient concern.

2.3 Not surprisingly, patients are especially worried about obtaining access to the most effective medicines to treat their particular needs. They want doctors to be free to prescribe the most effective drug based only on clinical need. They cited many instances where it had been difficult to get access to a recommended drug. Reasons included refusal by the primary care trust to pay for the medicine, inability by the pharmacy to obtain the drug in a timely manner, and differences in clinical opinion between a hospital consultant and the GP. Patients would like more choice, including the choice between generic and branded alternatives in the same drug class (Table 2). Patients questioned whether the cheapest medicine is always the best medicine and they were concerned that sometimes cost trumped efficacy in decisions about prescribing or access to medicines. They wished that national decisions to make a drug available were honoured uniformly at local level. And they were concerned that NHS leaders perhaps do not adequately brief pharmaceutical companies about current and future patient needs.

2.4 A second area of equal concern is access to information about medicines. Patients want details of innovative medicines to be more widely available. The demand is huge. Patients with chronic conditions want to be well informed about the drugs available, how they work, doses and dangers. Currently, that demand is not being met. The most helpful information sources patients use are highly varied (Table 3).

Table 2 Reasons given by the RCP Patient and Carer Network for wanting greater choice in medicines.
Alteration in symptoms with a multi-organ disease
Better quality of life
Change in condition
Disagreements between specialist and GP
Drug interactions
Drug withdrawals
Lack of effect of medicine
Side-effects (short and long term)
Tolerance to initial drug

Table 3 Main sources of information about medicines cited by the RCP Patient and Carer Network.
Their doctor
Other health service workers (eg specialist nurses, pharmacists)
Friends
National patient associations and charities
NHS Direct
National Institute for Health and Clinical Excellence (NICE)
Patient leaflets
British National Formulary (BNF)
Internet (eg Wikipedia, BBC)
Local libraries
Medical journals
Association of the British Pharmaceutical Industry (ABPI)
Blogs
Complementary medicine websites

Patients crave more information, not less (Table 4). They want the NHS, rather than any third party, to take more responsibility for educating doctors and patients about the medications they were taking. And it is in this area that patients are most concerned about the information provided directly to doctors.

2.5 Patients were anxious that doctors ensured their independence from the pharmaceutical industry. Many believed that doctors were 'too cosy' with companies, easily falling prey to their

Table 4 Information sought by patients, which is either hard to access or not available.
Side effects of medications and early warnings of in-use side effects
Ongoing clinical trials
Journal articles
Drug interactions
How to report an adverse drug reaction
Relative incidence of side effects
Simpler information made relevant for a patient's particular condition
Reasons for guidance

hospitality and gifts, their persuasion and power. The more conflicts of interest a doctor has, the more likely it may be that their clinical judgments are influenced by a pharmaceutical company.

2.6 Of more practical concern, patients sought new ideas for improving adherence to medications. A priority was for the size, shape, colour, taste, preparation and packaging of medications to be standardised across the European Union. Clearer labelling and instructions, including larger print, were additional heartfelt wishes. At present, wide variations in all these aspects of a medicine cause a great deal of confusion and uncertainty among patients.

2.7 The Patient and Carer Network expressed great concerns about adverse drug reactions. Most patients with chronic diseases who responded to our survey had suffered a side effect from a prescribed medicine serious enough to trigger a discussion with their doctor. This high awareness of adverse drug reactions led many of them to ask for better monitoring of drug safety, including more ways to report side effects. Patients are also concerned about the impact of counterfeit medicines on the efficacy and safety of the drugs they take.

2.8 Finally, patients responding to our survey were well informed about the importance of clinical trials. But most had not taken part in a trial, despite expressing a strong desire to do so. Those who had participated in a clinical trial gave varied and encouraging reasons for doing so: trials were seen as important to future patient care, as a means to advance knowledge, as a way to improve the patient's understanding of their own illness, and as a risk worth taking. Patients also expressed their 'desperation', 'fear', and a feeling that they had 'nothing to lose'. The fact is that many patients felt badly underserved by existing medicines, highlighting the urgent need for a thriving relationship between the NHS, academic medicine, the research-based pharmaceutical industry and the public. These issues are addressed more fully in Chapter 4.

Access to medicines

2.9 The UK government has publicly committed itself to a policy of expanding access to effective medicines. Alan Johnson, current Secretary of State for Health, has said:

> *We hold in our hands a range of medical interventions which are as extraordinarily successful as they are deceptively simple.… The success is due to science. The challenge is for the* [NHS] *administrators: making sure the system delivers the right services in the right places.*[45]

The government's view is that the prompt appraisal of new medicines by the National Institute for Health and Clinical Excellence (NICE), active uptake of those medicines by the NHS, and transparent, rational decision making by primary care trusts where there is no NICE guidance together constitute a coherent approach to the uptake of cost-effective drugs. But this position is fraught with contradictions. For example, the House of Commons Health Committee has endorsed NICE's role in rationing rather than expanding access to medicines.[46] There is an ongoing dispute between the ABPI, which argues that the UK is the 'poor relation' of other European countries because it underuses new medicines, and the British Generics Manufacturers Association, which says that to turn away from generics is 'to put drug company profits before the interest of patients'.[47] Evidence submitted to the Working Party by research-based pharmaceutical companies, perhaps not surprisingly, strongly supported the ABPI's position. AstraZeneca, for example, described serious deficiencies in the NHS's commitment to support innovation:

> *The culture of the NHS is often resistant to change, combining a conservative approach to prescribing, with layers of cost containment. Cost-effective technologies which have been recommended following national HTA* [health technology assessment] *can be subject to further qualification at a local level leading to 'postcode prescribing'. Consequently, the UK has one of the slowest international rates of adoption of new technology, and considerable geographic variation in medicines use, particularly in hospitals. This approach can delay and restrict patient access to new technologies. Both the Long-Term Leadership Strategy and the Cooksey report identified many cultural barriers to the uptake of innovation within the NHS that must be addressed….*
>
> *Failure to adopt cost-effective new technologies could eventually impair the ability of companies to conduct clinical research in the UK, because new medicines must be compared with the best available alternatives.*

2.10 The apparent failure, certainly as perceived by some patients, to have a coherent access-to-medicines strategy in the UK could be a serious obstacle, not only to current NHS service design, but also to future planning.[48] How will the NHS look in 10 years' time? While all estimates of future need are just that – estimates – there are identifiable trends, which are likely to be critical determinants of the demand for medicines.

The patient

Patient expectations of health and healthcare services will be much higher in the future, thanks partly to rising standards of education and higher incomes. Patients will seek care that fits in with their own locations and schedules rather than those of professionals. Patients will want more choice in how and where health services are provided.

Demography and society

The UK population will increase by around seven million by 2030. The proportion of people aged over 65 will increase from 16% to 23% during this time. Health inequalities will continue to present a challenge – in risk-taking lifestyles, in diminished access to services, and in poor health literacy. There will be a continuing trend towards smaller households, lone parents and more people living alone. Our current lifestyles will continue to present major risks to our future health – obesity, inactivity, sexually transmissible infections and alcohol use. Over a quarter of the population still smokes.

Disease

Because of an ageing population, and an adverse trend in health-related risk behaviours, the total burden of cardiovascular disease and diabetes will increase. Diabetes UK estimates that as many as four million Britons will have diabetes by 2025, up from 2.3 million today.[49] Increased prevalence of diabetes will drive further increases in renal disease. If individual risks for cancer remain the same, there will be substantial increases in demand for services as a result of demographic changes alone. Treatment models are likely to change from hospital-based to more primary-care-based management.

The UK health system

More people will be living with long-term and multiple chronic illnesses. The main cost pressures in the health system will come from an expanded population, new technologies and more staff. There will be changes in skill mix and to the ways professionals work in the health services. New models of social care are likely to be better integrated with health services (for example, extra-care housing, home-share, adult placement, technology-enabled services and connected care centres). Globalisation will influence political, economic and technical decisions about the future of the UK health system.[50]

2.11 Some observers have predicted that the next twenty years in medicine will see as much change as the past 200 years. Whatever scenarios emerge, it is not controversial to conclude that several forces are creating rapidly evolving disease patterns and health-system demands for the coming decades. It is essential that these patterns and demands are matched by a coherent and comprehensive access-to-medicines strategy for the UK population. The importance of this kind of strategy is now well accepted for low and middle income countries.[51] Currently, the UK is moving from a position of having no overall strategy in place to one where, with the aspirations of Ara Darzi's report, *Next stage review*, there is a commitment to make access to medicines a formal part of the NHS constitution.[52] Therefore:

2.12 We recommend that: **The UK Departments of Health, representatives of the medical profession, regulators (MHRA, NICE), industry and patient organisations should accelerate their work to debate, devise and develop an access-to-medicines strategy for patients in order to fulfil current unmet clinical need for prescription drugs, and to remove inequalities in medicines provision across Britain. This strategy could be initiated by the creation of a new Medicines Technical Advisory Group (MTAG), also involving the DH, representatives from primary care and hospital trusts, the MHRA, NICE, pharmaceutical companies, and professional and patient organisations.**

2.13 This formal joint working to produce a UK-wide medicines strategy, including the devolved administrations of Scotland, Wales and Northern Ireland, would go a long way to pool untapped expertise across many organisations. It could defuse conflict, provide a forum for constructive discussion, enhance transparency and build trust. This kind of collaboration would simply scale existing local collaborations up to national level, to plan services countrywide between the NHS and the pharmaceutical industry.[53]

Access to information

2.14 A former editor of the *BMJ*, Richard Smith, has argued that the information available about medicines is 'distorted'.[54] 'The public is being regularly deceived and exploited,' he wrote. The House of Commons Health Select Committee went even further.[16] MPs pointed out that industry funds over half of postgraduate medical education. Disease awareness campaigns, also funded by industry, are designed to influence patients. The Health Committee raised concern about the amount of money industry invests in marketing, through drug company representatives, medical conferences, medical journal supplements and direct advertising. The medical communications industry has evolved 'to improve sales figures', not to improve public knowledge, according to these MPs.

2.15 The information available to doctors and the public is greatly influenced by an elite group of key opinion leaders. These doctors are often respected clinical investigators or specialists who may be paid to speak or write on behalf of a company. Their views are often promoted as considered expert opinion about a particular medicine and its efficacy and safety. Industry's view is that this kind of promotion enables the latest evidence to be filtered through the knowledge and experience of experts. But in a recent investigation into pharmaceutical marketing, the *BMJ* concluded that 'key opinion leaders' was an 'Orwellian term used to describe the senior doctors who help drug companies sell drugs'.[55] The lack of truly independent advice to doctors has been exacerbated now that the *Drug and therapeutics bulletin* is no longer available free. It remains a respected newsletter that publishes robust reviews of new medicines and drug management for doctors, but now comes at a cost since the DH withdrew funding.

2.16 Patients are, according to the Health Select Committee, in an especially difficult situation. Their demand for information is substantial and increasing. But the availability of truly independent information about pharmaceuticals is limited. Indeed, sponsored disease awareness campaigns risk presenting biased information to the public. Evidence presented to MPs suggested that targeting patients as potential 'customers' for medicines was a crucial objective of these campaigns. The Health Committee argued for better patient information leaflets, and they advised against direct-to-consumer advertising. They sought ways of limiting the influence of industry on information available to patients. But their recommendations were vague and non-specific.

2.17 There has been some important progress with patient information leaflets, which are required by law to accompany every medicine. During the past three years, over 10,000 patient information leaflets have been user-tested in target patient groups. By early 2009, new and improved leaflets will be available for all new stocks of medicines. The MHRA views this initiative as the biggest step change in quality of patient information since the requirement for a leaflet was first introduced in the 1990s. Independent evaluations of these leaflets are planned for 2010.

2.18 The views of MPs on the Health Select Committee are not exceptional. Jerry Avorn, Chief of the Division of Pharmacoepidemiology and Pharmacoeconomics at Harvard Medical School, wrote:

> *…public relations firms spend considerable energy and money shaping the opinion environment in which we physicians live. Some companies specialise in setting up and paying for clinical trials solely to showcase the virtues of their client's product… the results are then reported in medical journal papers that may not reveal the details of the study's origins. Other firms arrange for sponsored continuing education sessions at meetings of professional societies, featuring academic speakers carefully selected to deliver a predictable message touting a specific medication.*[56]

2.19 In many ways, and in a UK context, these attitudes and practices are surprising. The ABPI Code of Practice for the Pharmaceutical Industry is clear:

> *Information, claims, and comparisons must be accurate, balanced, fair, objective and unambiguous, and must be based on an up-to-date evaluation of all the evidence and reflect that evidence clearly. Any information, claim or comparisons must be capable of substantiation…. Promotional materials and activities must not be disguised.*[57]

The ABPI has also produced strict guidance on pharmaceutical representatives, gifts and educational services, meetings and hospitality, relations with the public, media, patient organisations and the internet. There is no excuse for poor practice in industry's explicit obligation and, indeed, stated commitment to provide unbiased and reliable information to doctors and patients. The General Medical Council (GMC) has produced strict guidance for doctors in *Good medical practice*.[58] The GMC states that doctors 'must not ask for or accept any inducement, gift or hospitality which may affect the way you prescribe for, treat or refer patients'. It goes on, 'If you have financial or commercial interests in organisations providing healthcare, or in pharmaceutical or other biomedical companies, these interests must not affect the way you prescribe for, treat or refer patients.' [58]

2.20 The ABPI reaffirms current UK legislation by stating that, 'Prescription-only medicines must not be advertised to the public.' The ABPI's strong view is that medicines should continue not to be advertised to the public. The situation in Europe is less clear. In 2008, the European Commission issued a public consultation regarding a legal proposal on information to patients. The purpose of the consultation was to discover if 'good quality, objective, reliable and non-promotional information' on prescription-only medicines could be provided to European citizens. The reason behind the consultation was simple: European member states had varying policies on what information could be supplied to whom by industry. The result was 'unequal access of patients, and the public at large, to information on medicinal products'. Meanwhile, patients have become more empowered regarding the treatment of their illnesses. The goal of the Commission is, therefore, harmonisation across member states and a hope that a way can be found to allow industry to expand access to information about its medicines. Most observers view the European Commission's move as a 'significant shift' in favour of industry.[59] In the European context, one should take account of research showing that cross-border consumer advertising can cause potential harm to patients.[60]

2.21 Despite these concerns, the Working Party received much evidence – from the RCP Patient and Carer Network and from Kate Webb of *Which?*, for example – that patients urgently needed a comprehensive information strategy for medicines. Currently, one does not exist. For example, although the DH invests around £6 million each year to distribute the British National Formulary (BNF) and the BNF for Children, this information is directed mainly at health professionals. The BNFs are accessible online and the DH recorded 12 million website hits from January to April 2008, half of which were from non-NHS users. NHS Choices and NHS Direct also provide some medicines information. But these sources are incomplete and haphazard. Research evidence shows that information equals empowerment.[61] Patients may want oral or written information, and sometimes both, depending on their age, education and occupation.[62] The demand for information also seems to vary with disease.[63,64] Respondents to the Working Party consultation are clearly seeking a recommendation.

Independence

2.22 Less clear is the issue of doctors receiving payments, gifts, honoraria or hospitality from industry, and the influence this might have on patient care. It is impractical to think that *all* relationships between doctors and industry can be severed. Indeed, constructive relationships between doctors and the pharmaceutical sector can and should be encouraged to provide fruitful alliances for patient benefit – for example, in research, safety monitoring and access to unpublished data on file. The definition of the proper relationship will rely on devising the right terms of engagement between the two sectors. We will examine these terms in more detail in Chapter 3.

2.23 Still, from the patient's perspective, doctors are professionals who provide a public service. The public now has certain expectations of those who occupy positions of trust in public life. The Nolan Committee on Standards in Public Life has set out seven principles (Box 1) that it believes should apply to all those in public service.[65] Joe Collier, a former editor of the *Drug and therapeutics bulletin*, has argued convincingly of the value of these principles to medicine, albeit supplemented by additional safeguards.[66]

Box 1 The Seven Principles of Public Life.

Selflessness Holders of public office should act solely in terms of the public interest. They should not do so in order to gain financial or other benefits for themselves, their family or their friends.

Integrity Holders of public office should not place themselves under any financial or other obligation to outside individuals or organisations that might seek to influence them in the performance of their official duties.

Objectivity In carrying out public business, including making public appointments, awarding contracts, or recommending individuals for rewards and benefits, holders of public office should make choices on merit.

Accountability Holders of public office are accountable for their decisions and actions to the public and must submit themselves to whatever scrutiny is appropriate to their office.

Openness Holders of public office should be as open as possible about all the decisions and actions that they take. They should give reasons for their decisions and restrict information only when the wider public interest clearly demands.

Honesty Holders of public office have a duty to declare any private interests relating to their public duties and to take steps to resolve any conflicts arising in a way that protects the public interest.

Leadership Holders of public office should promote and support these principles by leadership and example.

Source: Committee on Standards in Public Life.[65]

2.24 These principles are now widely accepted and applied in public life. They provide an excellent basis for governing the relationship between doctors and the pharmaceutical industry (Box 2).

Box 2 The Seven Principles of Public Life applied to doctors.

Selflessness Doctors should act solely in the public interest. Their responsibility to patients must override all other interests.

Integrity Doctors should not place themselves under any financial or other obligation to industry, which might influence the performance of their duties as a doctor.

Objectivity Doctors should make decisions based on the best available independent scientific evidence.

Accountability Doctors are accountable for their decisions and actions. They must submit themselves to whatever scrutiny is appropriate to assure the integrity, objectivity, and honesty of their work.

Openness Doctors must be as open as possible about the decisions and actions they take. They must be prepared to give reasons for their decisions.

Honesty Doctors have a duty to declare any private interests relating to their public duties. They should take steps to disclose or resolve any conflicts arising in a way that protects the public interest.

Leadership Doctors should promote and support these principles through leadership and example.

Encouragingly, there is evidence from at least one randomised trial that this kind of explicit disclosure by doctors can strengthen loyalty between patient and physician.[67] Given this wide-ranging evidence, we make three recommendations:

2.25 **The DH should develop a comprehensive medicines information strategy for patients. A first step towards such a strategy – to create independent sources of evidence about prescription drugs for consumers – should be to commission a freely available print and online BNF for patients. The BNF is a trusted brand and authority for medicines. Its extension, with DH support, to supply information to patients would be an important advance to empower the public.**

2.26 **The RCP and the Faculty of Pharmaceutical Medicine, on behalf of the Academy of Medical Royal Colleges and the Royal Pharmaceutical Society of Great Britain, and working with the DH, should together devise, set standards for, and implement a policy for 'information prescriptions' about diseases and their treatment to be provided to patients with their prescriptions for medicines. This policy can be built around existing patient information leaflets produced by several organisations, including the RCP.[68,69] These prescriptions must be produced in partnership with patients or their representative organisations.**

2.27 **The RCP and the Faculty of Pharmaceutical Medicine should promote and apply the Seven Principles of Public Life among their fellows and members, and advocate these principles to the Academy of Medical Royal Colleges and the profession as a whole through the GMC.**

Adherence

2.28 Patients give priority to harmonising medicine preparations, which has encouraged the Working Party to recommend that:

2.29 **Manufacturers should make every effort possible to ensure that patients experience consistent presentation of medicines, so that the same medicine will always have a similar colour, shape and size of tablet, among other variables.**

2.30 **Pharmaceutical companies, encouraged by the ABPI and the British Generic Manufacturers Association, should review the packaging of their medicines to assist patients with visual or other physical difficulties.**

2.31 The Working Party's discussion about how to promote the more effective use of medicines, including adherence, repeatedly returned to the role of pharmacists. The pharmacy profession has been an undervalued resource in the UK. Pharmacists have a clear vision of their role in clinical care, education of patients and doctors, and commissioning of services. Most of these roles are currently under-recognised and underexploited. In clinical care, as part of the multi-professional team, pharmacists have a critical role in prescribing, providing information about medicines, monitoring adherence, pharmacovigilance and auditing clinical practice. These views have been endorsed strongly by patients,[70] as well as by the Royal Pharmaceutical Society of Great Britain who state that, for example, pharmacists are 'an obvious but underutilised resource in providing primary care services for black and minority ethnic groups'.[71]

2.32 There is a rich literature on the potential contributions that pharmacists can make to improve communication with patients. Sadly, much of this work rarely penetrates into medical journals. Disruptions in information transmission between professionals are common in clinical practice.[72] Yet these disruptions can be greatly reduced by enhancing the role of pharmacists in patient care and follow up.[73–76] Moreover, systematic reviews of randomised trials show that pharmacists can have important positive effects on care – for example, by reducing the risk of hospitalisation for patients with heart failure.[77] In the UK, there is encouraging evidence that patient-centred medicines management services led by pharmacists are associated with lower hospital-based mortality.[78] There is now a deep research interest in strengthening the training and competency of pharmacists to deliver these important benefits to patients.[79,80] This commitment is especially needed given the evidence suggesting that patients are often unable or unwilling to take their medications as prescribed.[81] These findings indicate the need for a radical review of the role of the 35,000 pharmacists working in the NHS, in line with recent recommendations set out in the government's white paper on pharmacy services. We recommend that:

2.33 **The Royal Pharmaceutical Society of Great Britain, in collaboration with the DH and others, should accelerate its work to expand the role of pharmacists in the delivery of medicines and medicines information to patients. We propose that every clinical team, in primary and secondary care, should routinely include a named pharmacist.**

Adverse drug reactions

2.34 In 1998, a startling report appeared in *JAMA*.[82] Jason Lazarou and colleagues reviewed data from 39 prospective studies and concluded that 106,000 (95% CI 76,000–137,000) patients died in hospital in 1994 because of an adverse drug reaction (ADR). If that figure was correct, ADRs would have been the fourth leading cause of death in the US, after heart disease, cancer and stroke. The investigators concluded, cautiously, that, 'While our results must be viewed with some circumspection because of the heterogeneity among the studies and small biases in the sample, these data suggest that ADRs represent an important clinical issue.' Several studies since this landmark investigation have confirmed the clinical importance of ADRs.[83,84] In the NHS, adverse events are common and 'a serious source of harm to patients'.[85,86] In one medical inpatient study, one in 10 admissions were reported as drug-related – mainly ADRs, but also overdose, misuse or treatment failure.[87]

2.35 Newer concerns have arisen about the dangers of counterfeit medicines, as part of an emerging culture of international crime. Already, the impact of counterfeit medicines has been felt in Africa, Russia and China. The WHO estimates that China has closed over a thousand illegal drugs manufacturers because of counterfeiting allegations. According to the WHO, counterfeited medicines probably represent up to 1% of pharmaceutical sales in developed countries, most of which come into circulation via internet sales. No deaths attributable to counterfeits in the UK have yet been documented. But expanded online access to medicines is opening up new routes for contamination of the UK medicines supply. For example, counterfeit Lipitor (atorvastatin, Pfizer) was discovered in the UK in 2005. The MHRA reports that the UK has become a common relay point for counterfeits, such as fake antipsychotics and antiplatelet drugs. The UK regulator now has a clear strategy, including collaboration with the WHO, to monitor and limit the impact of counterfeiting. Doctors have an important part to play in acting as the eyes and ears of the MHRA to identify possible examples of counterfeits in the clinical supply of medicines. Doctors and pharmacists should also check for counterfeiting if a patient fails to respond to a prescribed medicine.

2.36 What other measures can be implemented to protect patients from ADRs? In the US, a fierce debate has been raging for several years about the powers of the Food and Drug Administration (FDA).[88] Curt Furberg and colleagues accuse the FDA of failing to detect adverse events and of failing to implement the necessary mechanisms to ensure reliable post-marketing surveillance. There is no question that US physicians are anxious about the quality of adverse event reporting. New systems for detecting adverse drug events are being tested.[89] Institutional criticisms aside, what has become clear is that existing systems for detecting and validating adverse events simply do not always work. In the US, it has been recognised that the best way forward is to construct large computer databases that cross-link information from medical histories, prescription charts, diagnostic and treatment records and pharmacy reports.[90] In 2008, the FDA launched the first prototype of this system, Sentinel.[91] Using Medicare, the US system of care for the elderly, the FDA has constructed a database of 25 million patients that will act as a 'query structure' to investigate new safety signals. The US Secretary of Health and Human Services, Michael Leavitt, has called Sentinel 'a quantum leap forward'. However, the UK is potentially in an even stronger position. The MHRA has been, and continues to be, a leading authority on signals of ADRs. In addition, the General Practice Research Database (GPRD), which collects data on around 5% of the UK's population, is being upgraded with links to hospital episode statistics data and cancer registries. Given the 'cradle-to-grave' care offered by the NHS, many observers believe that analyses of enhanced GPRD data will offer a unique advantage to Britain's health system with respect to drug safety monitoring. Scotland's MEMO system (the Medicines Monitoring Unit at Dundee University) is an additional powerful mechanism to discover safety signals. In 2006, the MHRA launched the Yellow Card Scheme, a long-term strategy to strengthen reporting of ADRs by patients and healthcare professionals. In early 2008, community pharmacies took part in a six-week campaign to promote the scheme and patient reporting. At the instigation of the MHRA, the National Institute for Health Research (NIHR) has commissioned a research project on patient reporting, which is expected to conclude in 2010.

2.37 In the UK, the experience with Vioxx (rofecoxib) and Seroxat has put great pressure on drug companies to disclose more adverse event data before licensing.[92] These examples have created the impression that adverse events are well known, but they are simply hidden from public view. While this concern is, in part, real, it masks an even more serious problem: the lack

of any fully integrated and comprehensive system for continuous monitoring of drug safety. NICE has issued guidance on ensuring even more robust processes for collecting data on medication history.[93] And the Academy of Medical Sciences, in its 2005 report *Safer medicines*, made several recommendations for promoting the safer use of prescription drugs (Box 3).[94] These ideas remain relevant and the Academy has followed up this work intensively. Connecting for Health (the NHS information technology strategy) offers the possibility of a national database for monitoring drug safety. Nevertheless, the Working Party received evidence that suggested more could be done to encourage a safer culture for medicines use in the UK.

Box 3 Recommendations of the Academy of Medical Sciences for promoting the safer use of prescription drugs.

1. Expedite the application of new technologies to pre-clinical and clinical safety assessment through collaboration between industry, academia and regulatory agencies.
2. Rapid and thorough investigation of emergent clinical safety issues should be facilitated by international networks between countries with advanced healthcare systems.
3. Build and use large databases of patients to speed the detection of adverse reactions that increase the incidence of common diseases.
4. Reduce the risk of adverse drug reactions through greater public engagement.
5. Steps should be taken to address the decline in capacity in safety assessment.

Source: Academy of Medical Sciences.[94]

2.38 We recommend that: **NHS organisations and the MHRA should strengthen the system for doctors to report adverse drug reactions (including the computer software systems) by putting greater emphasis (in collaboration with the GMC and royal colleges) on the doctor's professional obligation to report adverse events at all stages of a medicine's life.**

2.39 **The MHRA should publicise and promote the system to enable patients to report potential adverse drug reactions online and/or in writing.**[95]

2.40 **The MHRA should launch a 'Yellow Card Day' to raise professional and public awareness about monitoring the safety of medicines in patient care.**

2.41 The culture change that needs to take place is for post-marketing surveillance to be integrated into routine clinical practice throughout the NHS. Again, the role of the pharmacist in the clinical team is likely to be critical in shaping this more vigilant safety-conscious culture.

Funding of patient organisations

2.42 Patients also expressed concern about the role and funding of charities and patient organisations. The House of Commons Health Select Committee praised patient organisations for the information and services they provided. MPs heard evidence about how this valuable work was frequently supported by the pharmaceutical industry. But the Committee also learned that industry described patient education through charitable support as a 'top-ranked marketing activity necessary to bring a brand to number one'. Few patient organisations disclose fully their relationships, financial or otherwise, with industry. MPs concluded that:

Patient groups should declare all significant funding and gifts in kind and the Government should seek to make appropriate changes to charity law to ensure this. It would in any case be greatly preferable if patient groups were funded by companies' charitable arms, rather than by companies themselves.[16]

2.43 The Working party agrees with this view. We did receive positive endorsement of industry's support for patient organisations (from Diabetes UK, for example), but other witnesses raised concerns. Michael Rawlins of NICE called some of these relationships 'sinister'. The ABPI Code of Practice requires companies to declare their sponsorship of patient organisations, to ensure that this relationship is set out in a written agreement, to refrain from trying to influence the work of that organisation in a manner favourable to its own commercial interests, and to disclose support of patient groups publicly.[57]

2.44 The UK charitable sector recognises the importance of these concerns to the public. In its submission to the Working Party, the Association of Medical Research Charities (AMRC) which represents 114 medical research charities in the UK, reported that about one third of its members have links with one or more pharmaceutical companies. The often negative media coverage about the relationship between charities and industry has led the AMRC to encourage greater openness in their associations, saying, 'It is crucial that such links are transparent if they are to retain public trust.' The AMRC 2007 report, *An essential partnership: principles and guidelines for working within industry*, sets out the terms of engagement for these relationships, based on independence, integrity and openness.[96] The Working Party endorses and supports these principles.

'As a charity we work with a number of pharmaceutical companies; they support our work in a wide range of ways, particularly around awareness raising amongst the general public about diabetes – the condition and its complications. Without their support, we would not have made the progress that we have done in terms of increasing the amount of awareness, so it is extremely important and often works well.'

Douglas Smallwood (16 November 2007)

3 Professional education

3.1 Education is one of the most contentious areas for clinical practice, academic medicine and the pharmaceutical industry. As medical historians Scott Podolsky and Jeremy Greene pointed out, although doctors have only 'recently awakened to a crisis over industrial influence in medical education', the origins of that crisis can be traced back at least to the 1950s.[97] Yet the present claims about the distortion of professional education, especially in the postgraduate years, sometimes seem apocalyptic. Two examples, one from the USA and one from the UK, are revealing about the current climate of suspicion. Both assaults have been mounted by former editors of respected medical journals.

3.2 Jerome Kassirer was editor-in-chief of the *New England Journal of Medicine* from 1991 to 1999. In his book, *On the take*, he describes how he first began to realise the extent of the entanglements between academia and industry when he became an editor.[98] He tried to implement a policy at the journal whereby authors of reviews –primarily educational articles – had to be free of financial conflicts with any company whose products (or those of their competitors) were featured in the articles. He found it increasingly difficult to find scientists free of such conflicts. His successor was forced to drop the policy. Kassirer explains how opinions in the journal were sometimes not qualified with full disclosure by an author about his or her involvement with a related commercial concern.

3.3 Kassirer frequently uses the word corruption. He argues that:

> *The integrity of individual physicians and physician organisations is at stake…. Whether intentionally or not, too many physicians have become marketing whores, mere tools of industry's promotional efforts. Others have engaged in pseudoscientific studies and published biased articles and educational materials that foster industry goals over patient goals…. It is time to expose the complexities and the extent of the complicity between doctors and industry… something must be done, because the health of every citizen is at stake.*[98]

3.4 Richard Smith was editor and chief executive of the *BMJ* from 1991 to 2004. In *The trouble with medical journals* he viewed the role of journals as educational tools with great suspicion. 'There is a sense in which all journals are bought – or at least cleverly used – by the pharmaceutical industry,' he wrote.[99] Is this the case across the whole of medical education?

> 'The extensive links between clinicians and industry are well documented and remain extremely worrying. The widespread use of paid opinion leaders as writers and speakers at conferences undermines trust in medical science and clinical practice. Medical education is increasingly dependent on industry funding.'
>
> Fiona Godlee (5 December 2007)

Undergraduate medical education

3.5 Good prescribing practice should be learned first at medical school. Training should include learning about non-drug treatments as well as the pharmacological management of disease. But still, for most doctors, prescribing a medicine is the most significant action they will undertake in patient care. Medicines are associated with risks. And so education about therapeutics should be a foundational aspect of the undergraduate curriculum. However, as Maxwell and Walley have pointed out, 'There is a pressing need to improve the training of prescribers at all levels.'[100] They argue that traditional courses in clinical pharmacology and therapeutics have been squeezed in an evermore pressurised curriculum. A clear statement of a core therapeutics curriculum is urgently needed (Box 4). They recommend that medical schools should adopt a 'student formulary' of 80–100 commonly used medicines. Medical students should be familiar enough with these drugs to be able to prescribe them under supervision. Maxwell and Walley, on behalf of the British Pharmacological Society, have made several valuable recommendations to this end (Box 5).

Box 4 A core undergraduate curriculum in therapeutics.

Core knowledge and understanding	Core skills
Basic pharmacology	Taking a drug history
Clinical pharmacokinetics	Prescription writing
Monitoring drug therapy	Drug administration
Adverse drug reactions	Prescribing drugs in special groups
Drug interactions	Prescribing drugs to relieve pain and distress
Medication errors	Adverse drug reactions and interactions
Poisoned patients	Drug allergy
Prescribing for patients with special requirements (eg the elderly, children, women of childbearing potential, pregnant and breastfeeding women, and patients with renal or liver disease)	Clinical pharmacokinetics
	Monitoring drug therapy
	Analysing new evidence
Legal aspects of prescribing drugs	Obtaining accurate objective information to support safe and effective prescribing
Developing new drugs	Obtaining informed consent to treatment
Medicines management	**Core attitudes**
Ethics of prescribing	A rational approach to prescribing and therapeutics
Commonly used drugs	Risk-benefit analysis
Common therapeutic problems	Recognising the responsibilities of a doctor as part of the prescribing community
Complementary and alternative medicine	Recognising personal limitations in knowledge
	Responding to the future

Reproduced with permission from Wiley-Blackwell, from Maxwell S, Walley T. Teaching safe and effective prescribing in UK medical schools: a core curriculum for tomorrow's doctors. *Br J Clin Pharmacol* 2003;55:496–503.[100]

Box 5 Recommendations for effective and safe prescribing in UK medical schools.

1 Prescribing and therapeutics should be identified as an important theme that runs vertically through the medical curriculum, integrating with and identifiable within relevant horizontal modules.

2 Core learning objectives should be clearly identified, including knowledge and understanding about drugs, skills related to the prescribing of drugs, and attitudes towards drug therapy.

3 The factual burden should be eased by prioritising learning around a core list of commonly used drugs (a student formulary).

4 There should be identifiable and robust assessment that these learning objectives have been met. This might form part of an integrated assessment, but it should not be possible to compensate for a poor performance in this area by a good performance in other items.

5 Each medical school should identify an individual teacher to oversee this area of the curriculum and to ensure that the learning objectives set out within the core curriculum are met.

Reproduced with permission from Wiley-Blackwell, from Maxwell S, Walley T. Teaching safe and effective prescribing in UK medical schools: a core curriculum for tomorrow's doctors. *Br J Clin Pharmacol* 2003;55:496–503.[100]

3.6 The GMC report *Tomorrow's doctors* states that students must demonstrate 'the effective and safe use of medicines as a basis for prescribing, including side effects, harmful interactions, antibiotic resistance and genetic indicators of the appropriateness of drugs'.[101] A GMC and Medical Schools Council working party has examined this issue further in a report published in 2007 and available online (www.medschools.ac.uk). The group investigated prescribing errors among junior doctors and defined what prescribing knowledge a newly qualified doctor should have on their first day. They established a list of competencies, including the ability to establish an accurate drug history, plan appropriate therapy for common indications, write a safe and legal prescription, appraise critically the prescribing of other practitioners, calculate appropriate doses, provide patients with information about their medicines, access reliable information about medicines, and detect and report adverse drug reactions. They also recommended that all strategic health authorities should provide a hard copy of the BNF to final year medical students, that final year examinations should include a test of prescribing competency, and that standardising the prescribing form was a key measure to assist junior doctors in safer prescribing. The Medical Schools Council and the British Pharmacological Society are developing an e-learning package for medical students to cover the knowledge base for clinical pharmacology. An updated *Tomorrow's doctors* is likely to include many of these recommendations. Work commissioned by the GMC to investigate the prevalence and causes of prescribing errors by newly qualified doctors will be published in 2009.

> 'The error rate [for prescribing] falls something like 80% in the first four or five years after graduation. If that was a learning curve in any other branch of clinical practice there would be outrage. If you can imagine surgical trainees being allowed to get their practice in on patients there would be outcry, but somehow [in] therapeutics, no one picks up the responsibility for that safety agenda.'
>
> Kent Woods (12 March 2008)

3.7 Iain Chalmers of the James Lind Initiative expressed the importance of 'consciousness-raising… about the need for defensible medical professionalism in commercialised healthcare and health research markets'.

3.8 Several witnesses identified the lost role of the clinical pharmacologist in delivering this curriculum. One of the biggest challenges for the Working Party was to reflect on the possible *future* role of the clinical pharmacologist. The President of the Academy of Medical Sciences, John Bell, said the clinical pharmacologist was an endangered species, and suggested they might play an important part in phase I clinical trials.

> '…it is a tragedy that people who are prescribing are not prescribing properly.'
>
> Joe Collier (5 December 2007)

3.9 Witnesses to the Working Party had varied views about the purpose of clinical pharmacology. Joe Collier believed it to be a tragedy that the discipline had withered. Clinical pharmacology needed to be redefined, he thought, perhaps around evaluation and policy rather than clinical science. The subject had a vital role, he insisted, in creating independent sources of evidence, teaching doctors how to think and read critically, and educating practitioners about how medicines fit into society and the overall health system. To this list, Kent Woods added teaching in therapeutics, drug safety, and linking the biological science of drugs to understand the on-and-off-target effects of medicines.

3.10 Jim Ritter pointed out that clinical pharmacology had never found a secure foothold in UK NHS service delivery. Pharmacists have distinct specialist knowledge that overlaps with clinical pharmacology in the important area of medicines management. And the discipline had so far failed to create a sustainable cadre of trainees to meet ongoing service demands in human toxicology. There were, and are, isolated examples of clinical pharmacology's success in a service as well as an academic setting (in Liverpool, for example), and ongoing areas of academic excellence (Cambridge, Edinburgh and London, for example). But the Working Party also heard from Jonathan Cohen that the new Brighton and Sussex Medical School, while recognising the vital importance of clinical pharmacology and therapeutics to the curriculum, decided that a clinical pharmacologist was not an academic or educational priority to teach that curriculum. A demand for a new generation of clinical pharmacologists may be unlikely. But this disciplinary obstacle does not mean, as Maxwell and Walley emphasised, that a named individual cannot be appointed to oversee responsibility for a newly reconstituted therapeutics curriculum. We will return to the issue of the future of clinical pharmacology in Chapter 5.

3.11 The increasingly recognised importance of this aspect of practice is leading to innovative educational partnerships. In October 2005, Brighton and Sussex Medical School launched a collaboration with one pharmaceutical company to teach a student-selected component (SSC) in Year 3 of the medical course. The SSC included eight half-day tutorials and 2–3 hours work each week for eight weeks. The curriculum covers drug discovery and development, regulatory frameworks, safety, clinical trial design, links between industry and the NHS, and an introduction to therapeutics and evidence-based medicine. The programme has recently been extended to Year 4 students. The company states that their objective is 'improving medical education and helping to increase transparency into the pharmaceutical industry research and development model and, we hope, our reputation with future prescribers'. Feedback from students has been very positive.

3.12 What are the views of medical students about their interactions with industry? In one US study, 80% of students believed they were entitled to gifts from industry, and most had accepted such a gift.[102] Two-thirds believed that gifts would not influence their practice. The researchers

concluded that students were 'at risk for unrecognised influence by [pharmaceutical company] marketing efforts'.

3.13 The Working Party was fortunate to receive evidence submitted directly by medical students from Medsin, a UK student-led organisation devoted to issues of global health and the NHS. Medsin's main concern was the maintenance of professional independence and patient trust. They raised specific concerns around the role of pharmaceutical representatives at case conferences, audits, journal clubs and grand rounds. These events are sometimes compulsory for students meaning their contact with industry marketing activities is enforced. Medsin also raised anxiety about overt industry sponsorship of what were intended to be educational events.

3.14 It was not only these links that concerned students, but also the lack of guidelines about best practices when students and industry representatives did interact. The pervasive gift culture that exists between pharmaceutical representatives and students and doctors has been shown to alter attitudes and behaviours.[103,104] Medsin wrote:

> *Clear, explicit policies are needed within medical schools that describe medical students' interaction with pharmaceutical company representatives…. All gifts regardless of their cost, including food, should be prohibited. A complete ban helps to remove potential grey areas. It also removes a key way in which representatives gain access to professionals…*

3.15 Regarding the specific funding of medical education by industry, Medsin argued that alternative sources of funding should always be sought. They advocated that if industry was to support medical education financially, an independent body should collect that money and disburse it so as to unlink any one company from any one educational initiative. Moreover, 'Industry should have no part in the design and content of the education,' they said.

3.16 In the US, academic-industry relationships are widespread and viewed mostly positively by department chairs.[105] In one recent survey, 60% of department chairs had a personal relationship with industry – as a consultant, a member of a scientific advisory board, a paid speaker or a member of the board of directors, for example. The degree of positivity depended on two variables: first, whether the funds were restricted (less favourable) or unrestricted (more favourable); second, the amount of funding involved. Small amounts of unrestricted funds (less than $10,000) were viewed most positively. Large amounts of restricted funds (greater than $100,000) were viewed most negatively.

3.17 A report to the Association of American Medical Colleges in June 2008 examined the nature of these relationships in medical education.[106] The task force that wrote this report failed to agree. Three industry representatives refused to endorse the final report and its recommendations. The conclusions of the report resonate with Medsin's concerns: that financial support and gifts can compromise the objectivity and integrity of teaching. The overriding concern of the task force was to devise recommendations that would support and strengthen medical professionalism.

> ❛The tough commercial environment for 'big pharma' appears to have shifted the balance between marketing and medical divisions towards the former; this is an obstacle to professional communication.❜
>
> Kent Woods (12 March 2008)

3.18 The US task force recommended that academic medical centres ban the acceptance of industry gifts, including food, by physicians and students. They advised that students should only be involved in meetings between faculty and industry 'for educational purposes and only under the supervision of a faculty member'. Moreover, when those encounters did take place, they recommended that the industry representative should be highly trained – for example, with a medical or pharmacy degree or a PhD. All industry educational funds should be given centrally to the academic medical centre for disbursement. The recipients of those funds should be the sole responsibility of the academic medical centre, 'with no involvement by the donor industry'. The task force also recommended prohibitions on industry-funded travel and ghost writing for students.

3.19 The Working Party received evidence both welcoming and criticising this report. Although the task force was perceived to be tough in a few areas, in others some critics believed it was lax. Even the allowance of educational activities funded by industry under highly regulated conditions was 'disingenuous', one respondent told us:

> *If there is a reason to ban gifts of pens, coffee mugs, or pizza slices due to the concern that such gifts may influence trainees' and physicians' behaviour, there is more of a reason to ban service on speakers' bureaus and advisory committees, consulting contracts, and particularly service as company executives, and on boards of directors.*

3.20 After reviewing this evidence, the Working Party recommends that: **Medical schools must take a stronger role in exposing students to medicines: their discovery, basic pharmacology, development, manufacture and delivery; medicines regulation; pharmacovigilance; the appropriate relationships between doctors and industry representatives (the Principles of Public Life); and the commercial aspects of the pharmaceutical industry. Once this curriculum has been developed, industry will have a valuable contribution to make to aspects of undergraduate teaching.**

3.21 The Working Party also recommends that: **Medical schools' responsibility for the quality of prescribing among newly qualified graduates must be acknowledged more explicitly. We believe that a mechanism should be sought to introduce more standardised assessment across medical schools in order to test the prospective doctor's prescribing skills. This would offer the public a level of confidence and quality assurance about prescribing practices. We encourage its consideration.**

3.22 The Working Party recognises that medical students may feel compromised in their interactions with industry. We recommend that: **There should be clear guidance to remove any uncertainties about students' interactions with industry:**

- **All gifts from industry to students, including food and travel, should be prohibited.**
- **Educational funds donated by industry should be disbursed by a centralised administrative unit, not by a company directly to a department or individual.**

However, we believe that within these broad limits the pharmaceutical industry does have an important and positive part to play in medical education. Industry has a distinctive voice that students deserve to hear.

Doctors in training

3.23 After the Foundation 1 year, the responsibility for prescribing quality transfers from the medical school to the employer, whether that is a hospital or a primary care trust. However, despite the good work of the National Prescribing Centre, there is no publicly available national measure or report card on prescribing quality, despite the fact that spending on medicines represents over 10% of NHS expenditure. This lack of accessible data is as astonishing as it is indefensible. Part of the difficulty is that no single institution is charged with this responsibility. Fragments of data are available in various locations (the National Prescribing Centre and the Quality and Outcomes Framework, for example), but there is no systematic NHS-wide monitoring and evaluation mechanism.

3.24 This omission should be a focus of urgent action for those with responsibility for patient care. Research into perceptions about safe prescribing practice among newly qualified doctors indicates reason for concern. In Australia, for example, half of students surveyed lacked confidence in prescribing warfarin; one third were uncomfortable ordering intravenous fluids.[107] Students seemed to feel they were unprepared for prescribing. This lack of experience leaves young doctors possibly open to adverse influences from pharmaceutical marketing.[108] The residual vulnerability is not addressed systematically in postgraduate training, and the evidence base to do so is inconsistent.[109]

3.25 The House of Commons Health Select Committee recommended mandatory postgraduate training to ensure that doctors were up to date with the latest prescribing practice.[16] The royal colleges do assume significant responsibility for postgraduate education in prescribing. For example, the curriculum for core medical training, which must be attained by all doctors pursuing a physician-related discipline, requires knowledge about the practice of safe prescribing, using guidelines appropriately, writing clear and unambiguous prescriptions, engaging patients in discussions about medicines and their side effects, recognising the range of adverse drug reactions, using the Yellow Card Scheme, and liaising with pharmacists, among other skills.

3.26 The prohibitions that the Association of American Medical Colleges apply to students also apply to doctors in training.[106] But despite an apparently common and agreed approach, little action has actually been taken. The reason is that no institution has been charged with responsibility to offer guidance and leadership. In the Working Party's view, this leadership needs to come from a collaboration between the GMC (which sets professional standards for doctors), the MHRA (which sets standards for licensed medicines), and NICE (which sets standards for the use of licensed medicines in practice).

3.27 Kent Woods emphasised the valuable part the MHRA has to play in encouraging better prescribing. In the UK, we simply do not take prescribing seriously enough. The MHRA is in a privileged position to lead professional standards and public debate about education for safer prescribing. It could take up a far more active role. The FDA in the USA has also been criticised for not doing more to deliver prescribing information to practitioners.[110]

3.28 In an Ipsos MORI poll conducted by the MHRA of 300 health professionals in July 2006, an incredible 55% of hospital physicians and 37% of GPs had never heard of the MHRA. The MHRA has since recognised that it needs to upgrade its educational and public affairs role to ensure 'that professionals and the public have the information they need about benefits and risks to support their healthcare services'.[111] The MHRA is initiating reviews of medicines legislation

and their *Drug safety update* is an excellent example of its work to provide new information to professionals and patients. It provides a firm basis for expanding MHRA's role still further, and connecting with other organisations that have a strong interest in improving professional standards of prescribing practice.

3.29 **For the benefit of doctors in training, the royal colleges, the MHRA, NICE, the ABPI, and the GMC should together adopt a stronger role in promoting standards of safer prescribing and interactions between doctors and industry representatives.**

3.30 **The NHS should assume explicit and transparent educational funding responsibility for doctors in training – for example, through personalised and portable study leave and education budgets. The goal should be to wean the education of doctors in training off pharmaceutical industry support over a time-bound period, such as five years. All gifts to doctors in training, including food and travel, should end.**

Continuing professional development

> '…the role of industry in CPD has predominated partly because of the failure of the NHS to make financial provision for CPD and partly as marketing pressures from industry have intensified.'
>
> Kent Woods (12 March 2008)

3.31 'GPs 'bombarded' by drug companies'.[112] This picture of relentless pressure on doctors, exerted by pharmaceutical marketing masquerading as education, is common. Organisations such as the ABPI defend drug promotions to doctors as part of industry's effort to tell practitioners about new medicines, to keep doctors up to date. Industry has planted deep roots in postgraduate medical education. And questions remain about the resulting risk of undue commercial influence on professional development.

3.32 Ray Moynihan reported how sponsors of supposedly independent education events have been given special privileges to recommend speakers and align messages.[113] Some estimates suggest that since industry pays for about half of all postgraduate medical education, this financial support could lead to substantial bias in a doctor's professional development. The risk of such bias has long concerned both professional and public opinion in the US.[114–117] One company has ended all education programmes organised by for-profit enterprises. The company's goal has been to erase the appearance of drug promotion through continuing professional development. And from 2009, PhRMA, the US pharmaceutical trade association, has banned pharmaceutical representatives from giving doctors pens, mugs, notepads and out-of-office dining and entertainment. This is an example of how publicly expressed negative impressions of industry have led to valuable changes in attitude.

3.33 The Working Party received conflicting views about the role of industry in postgraduate medical education. Joe Collier spoke of the 'excesses' of industry. By contrast, several GPs argued that much of the pharmaceutical educational material they received was helpful. It raised their awareness about new medicines. Novartis suggested that, 'Access for pharmaceutical representatives to see NHS personnel should be wider, where the majority of pharmaceutical representatives provide a valuable role informing [doctors] about new and existing medicines.'

3.34 But there is a danger that we overemphasise the responsibility of industry in postgraduate medical education. As Kent Woods pointed out, surely the NHS should have a stronger interest

in providing unbiased information to practitioners. Industry has simply stepped in to fill the vacuum left by a health service that has cared too little about the educational and training needs of its professional staff.

3.35 The provision of information to doctors is highly regulated. The ABPI Code of Practice sets out rules on advertising, claims and comparisons, provision of reprints, the use of quotations, distribution of promotional material, disguised promotion, the activities of representatives, gifts, inducements, educational goods and services, promotional aids and meetings.[16] This guidance has been toughened in recent years in response to higher public expectations about the industry's behaviour. The organising principle of these industry-led reforms has been that industry must be more strongly governed by its scientists, not its marketing force.

3.36 The RCP has developed specific guidance about the relationship between doctors and industry.[118] The College's concern has focused on the way pharmaceutical promotions might adversely interfere with a physician's independent professional judgment. The Working Party received several examples of guidance on how doctors should interact with industry in educational settings.[119] These recommendations uniformly require the highest standards of independence on the part of doctors to ensure patient safety and public trust.

3.37 The balance of evidence the Working Party has received leads us to recommend that: **The NHS must collectively revitalise its role in supporting and disseminating evidence-based resources to strengthen postgraduate medical education. In addition to the commitments made to establish NHS Evidence as an extension of NICE,[52] an important first step would be to secure as soon as possible the long-term future of the BNF and to ensure that a hard copy reaches all doctors in the UK.**

3.38 **Relevant royal colleges and faculties, on behalf of the Academy of Medical Royal Colleges, together with the GMC, should convene a conference to define a framework, guidance and code of conduct about how doctors, NHS institutions and industry should work together to support postgraduate medical education. The intention would be to clarify the relationships between industry educational support for the individual, the department and the institution.**

3.39 **Employers must take greater steps to assume responsibility for prescribing quality after the Foundation 1 year. The Healthcare Commission – and its successor, the Care Quality Commission – should monitor the educational outcomes of NHS institutions.**

3.40 **New ways should be found to reduce the reliance of postgraduate medical education on sponsorship by pharmaceutical companies and the wider biomedical industry. Alternative sources of sustainable funding should be sought – for example, through the royal colleges and DH. In doing this, the implications for organisations such as the royal colleges and specialist societies should be considered carefully.**

3.41 **In rewriting the relationship between medicine and the pharmaceutical industry, and in the spirit of a more balanced and mutually respectful partnership, all gifts to doctors, including food and travel, become untenable and should end.**

3.42 **The ABPI and its members should establish a pooled fund to invest in medical education. Such a fund would unlink financing from a single company, diminishing the perception of undue commercial influence and bias.**

3.43 **Any honorarium or fee, commercial or otherwise, paid to a doctor should be declared on a publicly accessible database. If the work being remunerated is completed in NHS time, that fee should be paid to the doctor's host institution to reinvest back into the NHS. If the work is conducted outside of NHS time, this payment should simply be made transparent. We urge the RCP, the Academy of Medical Royal Colleges and scientific societies to adopt this recommendation quickly. We urge employers to implement it in collaboration with professional bodies.**

3.44 **The ABPI should work harder to disseminate and implement its Code of Practice. We propose that the ABPI should organise an annual conference for medical professionals and policy makers to review the part that pharmaceutical companies play in shaping doctors' attitudes and behaviours.**

4 Research for health

4.1 A unique comparative advantage for the NHS should be its ability to sustain a health-system-wide, research-intensive culture to meet the health priorities of the nation and the individual needs of patients. However, witnesses to the Working Party reported repeatedly that clinical research across the NHS, especially research that involved industry collaboration, had a reputation for being slow, costly, inefficient, lacking leadership and commitment, offering few incentives, and provoking suspicion among clinicians. These negative impressions have not been helped by headlines such as, 'We saw human guinea pigs explode' (*The Sun*, 16 March 2006) and 'Hell of human guinea pigs' (*Daily Mail*, 17 March 2006). The media response to the serious adverse effects that followed administration of TGN1412, the world's first CD28 antibody, to human volunteers was predictable, and unsurprising. A drug trial was seen to have ended in disaster, with several previously fit and healthy individuals ending up critically ill in an intensive care unit. Relatives of these volunteers expressed 'fury at drug test firm that had never experimented on people before', although this was not strictly correct – the contract research organisation that conducted the trial had much experience of running clinical studies. The message was unfortunately all too clear: one takes part in pharmaceutical research at one's peril.

> 'The issue of publication bias is not confined to industry. There is publication bias within academia in independent studies as well….'
>
> Iain Chalmers (9 January 2008)

4.2 The TGN1412 incident provoked a wave of soul-searching about the risks of human experimentation among scientists.[120] In truth, of course, medical research involving human participants is heavily regulated with strict legally enforced guidelines governing the ethical conduct of any study. Beyond these requirements, the RCP has published detailed guidance on the ethical regulation of clinical research, covering aspects of investigations such as: benefits, the responsibilities of investigators, legal background, consent, use of placebos, research in special groups of participants (those with mental ill-health, older people and children), special classes of research (genetics, surgery, and complementary and alternative medicine), and financial considerations (payment to research participants and investigators).[121]

4.3 The risks of developing a new medicine are finite for all those involved. For the pharmaceutical company, it takes a decade on average to develop a new medicine, at a cost of well over £500 million. Only a tiny fraction of new chemical entities put into development survive testing – perhaps as few as one for every 5,000 molecules tested.

> 'The pharmaceutical industry has become overwhelmingly dominant in the funding and performing of clinical research. The balance between industry and public funding has shifted decisively in industry's favour.'
>
> Fiona Godlee (5 December 2007)

4.4 Although the view that the pharmaceutical industry is losing its innovative edge does not stand up to careful scrutiny,[36] the pressure to accelerate innovation is increasing. The costs of

all western health systems are escalating quickly, and companies must find ways to reduce costs of drug development if they are to survive a hostile financial environment.[122] As the US General Accountability Office reported in 2006, several factors have conspired to challenge existing pharmaceutical research and development models.[123] First, scientists are finding it hard to design innovative medicines because of challenges facing our understanding of disease pathophysiology. The genomic revolution should dramatically expand the number of potential drug targets. But, for now, limitations in scientific knowledge pose difficulties for industry. Second, following several regulatory controversies (for example, over rofecoxib and celecoxib), agencies are now more careful over their drug safety reviews. And third, what industry perceives as increasingly restrictive intellectual property protection may be discouraging innovation.

4.5 In the UK, the DH has worked closely with the ABPI and others to develop a model clinical trial agreement for industry-sponsored research taking place in NHS hospitals. This agreement arose out of concerns within the Pharmaceutical Industry Competitiveness Task Force that the UK was losing its leadership edge in the highly competitive market for conducting clinical trials (we will return to this issue later in the chapter). This model trial agreement provides a template to facilitate the initiation of trials within the NHS.[124] Its use in unmodified form cuts trial initiation times by half. Other measures to support faster initiation of trials include the new research passport, roll out of an integrated research application system, and costing templates and guideline tariffs for contract trials run by clinical research networks of the NIHR.

> ‘The Research Assessment Exercise tends to incentivise basic research at the expense of clinical research and applied research generally. As we look at the funding mechanisms for research, we must develop mechanisms whereby clinical research, and even negative clinical research (in terms of getting negative outcomes), is actually as well regarded as the more attractive basic research which comes up with great drug development opportunities.’
>
> David Cooksey (23 April 2008)

4.6 Industry and the NHS share common goals in fostering a research-intensive culture in clinical care. The NHS aims to improve the quality of care, in clinical effectiveness, patient safety, and the patient experience. Industry aims to increase shareholder value by developing new medicines that meet clinical need. The shared goal is to improve patient outcomes through collaboration. The development of new medicines and their rapid introduction into clinical settings therefore demands a receptive and responsible system of research governance that facilitates the initiation and completion of trial protocols. UCL Partners – a joint venture between five London institutions (University College London, UCL Hospital, Great Ormond Street Hospital for Children, Moorfields Eye Hospital, and the Royal Free Hospital) created in 2008 – is aiming to create an internationally competitive environment conducive for translational research in collaboration with industry.

> ‘In the NHS clinical domain, there is very great concern about the competence of prescribing, not only in terms of patient safety, but also in terms of cost-effectiveness of prescribing. But those concerns do not seem to be communicated to academia. Academia has been deflected towards… research… which does not link into the preoccupations of clinical practice.’
>
> Kent Woods (12 March 2008)

Encouraging innovation in research

4.7 Innovation no longer only means discovering a new medicine. Innovation means finding new ways to meet the increasing expectations of licensing authorities, technology assessment programmes, and payers. Innovation means finding more effective ways of failing early before a research programme has absorbed significant cost. And it means finding new ways to manage risk. No pharmaceutical company can tackle innovation alone. Industry will only be able to enhance its innovative capacity through partnerships with the NHS and academia. These challenges are not confined to the UK. They represent a predicament facing some of the most successful research-intensive nations in the world.[125]

> 'As far as I am concerned, ticking the boxes for 18-week waits is the bare minimum. We hope to do much better than that for patients – it is about optimising patient care and I think that the best thing for patient care is a research-intensive environment.'
>
> Robert Lechler (23 April 2008)

4.8 A shortage of suitably qualified science graduates is a major limiting factor in the capacity for innovation at every step of bringing a new medicine to the patient.[126] In 2007, the Academy of Medical Sciences investigated research careers in academia and industry.[127] They found a serious 'information gap' between industry and academia, and 'a lack of communication about the intellectual challenges of industrial research'. Academic researchers had an especially strong commitment to university careers, fearing disconnection from an environment that encouraged freedom of inquiry if they moved to a more commercial setting. Some university academics saw a career in industry as 'second best'. One industry researcher ruefully remarked that his NHS colleagues thought he had 'sold out to the dark side'.

4.9 While there are opportunities for mobility between industry and the NHS, the Academy of Medical Sciences concluded that stronger links should be made between the two cultures. New schemes to enable clinical academics, especially younger scientists, to obtain industry experience should be created. Industry scientists should be encouraged to train in universities. The key was career flexibility, not currently a feature of most university or NHS career paths. Leadership was needed to raise awareness of potential opportunities for cross-cultural exchange.

4.10 In the US, the General Accountability Office argued that more scientists were needed 'who possess the skills needed to translate drug discoveries into effective new medicines'. These sentiments have been echoed with growing concern by the ABPI. In figures provided to the Working Party, the number of industry-academic PhD studentships declined steadily from 676 in 2003 to 627 in 2005, and to 564 in 2007. The number of postdoctoral grants also fell from 408 in 2003 to 323 in 2005, and to 318 in 2007. Researchers often report huge disincentives to building industry-academic collaboration: red-tape, lack of investment in high risk research, and poor career structures.

> 'Government must also have mechanisms to support therapeutic research in those areas of 'market failure' – orphan diseases, tropical diseases – in partnership with industry, which otherwise will be increasingly neglected as commercial pressures on the industry increase. Doctors likewise have a role to play in influencing policy by advocacy.'
>
> Kent Woods (12 March 2008)

4.11 Of even greater concern is the observation that the UK's leading position in pharmaceutical research and development is threatened by a lack of scientists with appropriate *in vivo* skills.[128] Almost three-quarters of employers believe that these recruitment difficulties are having an adverse effect on research productivity. The supply of scientists with *in vivo* skills seems to be related to a decline in the study of the practical aspects of animal physiology and pharmacology at university. There is also concern that the sometimes virulently anti-research stance of organisations opposed to the use of animals in laboratory science has created a climate of fear and distrust around this sector of study. The ABPI and BioSciences Federation concluded that 'more needs to be done to create a sufficient pool of talent and skills to attract and retain new UK research and development investment'. Part of the answer remains in persuading the public of the value of animal research. And part remains in expanding opportunities for young scientists to experience industry research, perhaps through summer schools for undergraduates and postgraduate employer placements. The 2006 Cooksey report stressed the importance of translational medicine research.[129] But current trends suggest that international pharmaceutical companies will relocate to countries such as China, India and Singapore where *in vivo* skills are more successfully fostered. This relocation would have a severely adverse effect on the research base in the UK.

4.12 The Working Party therefore concludes that: **Universities should demonstrate stronger leadership in seeking appropriate and genuinely integrated scientific partnerships with industry at all levels of their research portfolio, from basic science to clinical trials. Universities and the pharmaceutical industry should seek to widen the possibilities for joint funding of academic staff to work across both domains.**

4.13 **The Medical Research Council (MRC), NIHR, Wellcome Trust, Association of Medical Research Charities, and universities, together with the ABPI, should investigate the UK skills base for translational medicine with a view to devising and implementing policies to redress existing or projected skills gaps.**

Sustaining clinical trials

> 'Clinical research generally has been undervalued, not just in Britain. The Americans have had the same sort of worry; we have not done well on clinical research.'
>
> Michael Rawlins (9 January 2008)

4.14 Clinical trials are one of the most cost-effective investments a society can make to improve healthcare. For example, a review of all phase III randomised trials funded by the US National Institute of Neurological Disorders and Stroke before 2000 found that the result of those studies provided a net financial benefit to society a decade later of over US$15 billion.[130] Net benefit was calculated based on a health-economic model designed to estimate costs, savings and effects on public health. The health benefits were calculated in terms of additional quality adjusted life years (QALYs). The annual return on investment was 46%, well above that of any stock market investment. It is true that trials lead to increased health spending. But the resulting health benefits are even greater. This finding remains largely a hidden secret of clinical research; it deserves widespread promulgation.

> 'Transparency and trust live in the same house and I think it is in the interest of everyone to be more transparent.'
>
> Nigel Brooksby (20 February 2008)

4.15 Yet the climate in the UK – in the NHS and in academic medicine – for conducting clinical trials is unstable. Investment in clinical trials by industry depends on a calculus of cost, time and quality. The quality of clinical trials remains high, although Britain is now no better than many other competing nations. Trials in other countries, notably China and India, are now more cost-effective. And the regulatory bureaucracy surrounding trials has rendered the UK too slow in execution and delivery compared with other countries. The Working Party was told of instances where, when a study had been given a green light to start in the UK, it had already been completed and closed in other non-UK trial centres. Clinical Research Networks in the UK have not yet delivered on their promise of enabling clinical trials to take place more readily. And NHS bodies seem to offer few incentives to foster a flourishing clinical trials culture in their day-to-day practice. One industry leader described the attitude of the NHS to clinical trial research as 'pitiful'. Those responsible for fostering a positive research climate within the NHS admit that the culture for research is variable, but they argue strongly that there has been significant progress in creating a cohesive infrastructure to support research – NIHR biomedical research centres and units, clinical research facilities, and clinical research networks, for example.

4.16 The result of this slow but firm decline in the UK's clinical trial performance is that patients are losing out on opportunities to take part in research to develop new medicines. Indeed, Britain is rapidly becoming a second-tier nation in its attitude to modern medicines. In terms of patient recruitment performance in Pfizer trials, for example, Spain, the Netherlands, Sweden, Canada, Germany, the Russian Federation, Australia, the USA and Japan all do better than the UK.[131] According to the ABPI, 23% of UK trial sites failed to recruit patients in 2006. That figure rose to 28% in 2007. During 2005–6, the average time from notification of a clinical trial to the first patient visit (the research and development start-up time) was 101 days. In 2007, that time had increased to 173 days. Meanwhile, the UK cost-per-patient in clinical trials is now higher than in the Netherlands, Scandinavia, Germany, France, Poland, Hungary and the Czech Republic. Industry research leaders are now redirecting studies to emerging markets with high recruitment potential in Eastern Europe, Latin America and Asia. Although data are sometimes conflicting, evidence presented to the Working Party indicated that in 2000, 6% of global patient enrolment took place in the UK. By 2006, that figure had fallen to 2%. In a global ranking of overall country effectiveness for clinical trials, based on an analysis of patient pool, cost efficiency, regulatory conditions, relevant experience, infrastructure and environment, the UK now ranks equal sixth with the Czech Republic after the US, China, India, Russia and Brazil.[132] (Interestingly, this scaling up of research in middle income settings is rapidly strengthening research ethics frameworks in these countries.) The UK's sliding performance in clinical trials is also mirrored in the non-commercial sector.[133] There is an additional concern that loss of this critical mass of research activity will include a 'brain drain' of high quality medical and scientific staff.

4.17 Part of the concern around creating the right environment for clinical trials is the inadvertent damage caused by the EU Clinical Trials Directive. Although the purpose of the directive in 2001 was to make research easier to conduct, it has achieved exactly the opposite outcome. The main concerns held by researchers are around inappropriate approaches to monitoring, life-threatening delays for consent, difficulties with clinical trial authorisation, burdensome good manufacturing practice requirements, and inefficient allocation of responsibilities to the parties sponsoring the trial. A group of distinguished international trialists have published recommendations about how to save large sums of money from trial costs, while at the same time preserving both ethical oversight and scientific integrity.[134]

> 'Time and again you see relationships in which the industry holds the whip hand. Do a trial for me; they design the trial; they write the paper. Where is the mutual advantage here apart from money? There can be mutual advantage, but it must be open.'
>
> Joe Collier (5 December 2007)

4.18 Evidence submitted to the Working Party on behalf of JP Garnier and Andrew Witty of GlaxoSmithKline put it most starkly of all:

> *Stated intentions to date suggest that the NHS and academia do want to work together, but implementation of this intent is patchy and ambivalent…. Appropriate incentives and rewards are required for all parties to make this relationship mutually beneficial to an extent and pace that are globally competitive. At present, industry phase II/III research is not viewed equally to academic research, and the UK's performance in industry trials is generally poor.*

4.19 Patient access to information about clinical trials is another important consideration (please refer also to paragraph 2.8, the results of the Working Party's survey of the RCP Patient and Carer Network). Here, the NHS is making good progress. During the 60th anniversary of the NHS in July 2008, the government made a commitment to a new Research Capability Programme to be situated within Connecting for Health, which would inform patients about clinical trials they might be eligible to participate in. The goal is to provide NHS staff with information about approved clinical trials so that this information can be passed on more efficiently to patients.

4.20 In the light of this evidence the Working Party recommends that: **Professional organisations, such as the RCP, Academy of Medical Royal Colleges and Academy of Medical Sciences, together with their members and fellows, need to lead with a stronger voice: to support research collaborations between industry and the NHS that promote higher quality care, innovation and continuous learning; to work with the DH to devise incentives for NHS bodies and doctors to take part in research, especially clinical trials; and to partner more effectively with the research community to challenge the increasing regulatory bureaucracy that is eroding the UK's competitive edge in clinical trial research.**

4.21 **The MRC, NHS and Academy of Medical Royal Colleges must devise more effective ways for patients to learn about ongoing trials and, where appropriate, facilitate their participation in those trials. The MRC and the NIHR should also establish more transparent ways to include patients in their decisions about research priorities, from bench to bedside.**

4.22 **The NIHR should consider creating large patient registries as a means to conduct post-licensing safety studies after a new medicine has been introduced into clinical practice. Acting on this recommendation might be one tangible way to incentivise a currently weak safety research community within the NHS and universities.**

The right relationships

4.23 Partnerships between clinical research groups located within universities or NHS organisations and the pharmaceutical industry are not uncommon. But, as the preceding review of clinical trial activity has revealed, these relationships are strained. This is partly because of prevailing concern that the academic and clinical community loses its independence and authority through industry collaboration. Yet research commonly shows that individual

academics have deep links with pharmaceutical research and development.[135] The conclusion drawn frequently is that these multiple ties to industry are harmful and should be discouraged.[136] On the contrary, if the UK is to accelerate a leadership position in phase I and II (translational) research, such collaborations need to be assembled with urgency.

> '…studies done by academia alone are not as good as they could be; studies done by industry alone are not as good… I think it is real collaboration that is the key…'
>
> Rory Collins (12 March 2008)

4.24 In the US, the heat around the issue has become intense. Congress is reviewing scientists, aiming to expose what it deems to be undeclared financial conflicts of interest.[137] This political intrusion into the university is likely to discourage fruitful industry-academic research partnerships still further. Investigators will justifiably be fearful of political and professional criticism for partnering with the pharmaceutical sector.

4.25 Yet now is the time for more, not less, industry-academic collaboration. Garret FitzGerald, Director of the Institute for Translational Medicine and Therapeutics at the University of Pennsylvania and a member of the Institute of Medicine's Forum on Drug Discovery, Development and Translation, has likened industry and academia to 'star-crossed lovers' facing both challenge and opportunity. 'How might they reposition themselves,' he asked in a *Science* editorial, 'to interact effectively and bring new drugs to the table?'[138]

4.26 This need for enhanced partnerships was expressed in evidence to the Working Party from general practice and pharmacy researchers. The NHS has pledged its commitment to channel resources into primary care. But this turn in the direction of care delivery needs to be matched by a parallel investment to increase the primary care research base in therapeutics. There are encouraging signs that this is taking place – for example, with the creation of an NIHR school for primary care that links academic centres of primary care research to support applied research in general practice. We were told that academic GPs often find it difficult to obtain research funding. They were hopeful that industry might invest in the primary care research base. Such investment would help to create a new generation of research-minded GPs.

4.27 Much of this debate is conducted from entrenched positions either for or against industry collaboration. This approach is neither sensible nor desirable. Lisa Bero has recently outlined a proposal for a more data-driven strategy towards industry-academia collaborations.[139] She suggests more public monitoring of research collaborations:

> *These different corporate-academic funding models must be rigorously evaluated for their effects on research integrity, faculty attitudes, technology transfer, and research productivity. For example, we could compare the quality and quantity of academic publications of faculty working within different institutional funding models. We could also compare measures of technology transfer (such as patents and licenses* [sic]*) for faculty working within different models. With additional evidence, decisions… may be informed by data from these evaluations, as well as ethical considerations.*

4.28 This evidence leads the Working Party to recommend that: **NHS leaders, regulators, research funders, industry and academia must endorse and encourage more strongly and publicly a research culture in the NHS that is centred on improving the quality of patient care.**

4.29 Every NHS and primary care trust should have a designated 'research champion' on its board. This individual's objective would be to advocate for research within their organisation and to encourage a culture where research is fruitfully and productively completed, including with industry.

4.30 Employers and professional organisations should consider ways to incentivise individual doctors who take part in research, such as protected time, excellence awards or Quality and Outcomes Framework (QOF) payments.

4.31 Those charged with allocating resources based on research output, such as the Higher Education Funding Council, should do more to recognise and reward academic-industry collaborative research, especially clinical trials.

4.32 Professional bodies with responsibility for postgraduate medical education (such as the GMC and royal colleges) should support and develop the notion of academia-industry modules or placements in the Foundation 2 training year. This would be a valuable means to promote and sustain a positive culture of collaboration between industry and the NHS.

4.33 The MRC and the Economic and Social Research Council (ESRC) should join together to fund the monitoring of outputs from different research funding models, especially those with industry, in order to optimise conditions for research and development of new medicines to fulfil unmet clinical need.

5 The correct culture

5.1 The widespread view among commentators on the pharmaceutical industry and the NHS is that we have the wrong culture. Medicine is hooked on the drug industry, according to the American physician-ethicist, Howard Brody.[140] Doctors betray the public's trust by accepting gifts from companies. The American health writer, Shannon Brownlee, blames industry and others such as the FDA for:

> *…distortions in the medical literature, the co-opting of academic thought leaders, the wooing of physicians with lavish dinners, free samples, …trips to exotic locales, …designing biased clinical trials, recruiting compliant academics to run them, controlling the analysis and write-up of the results, and then using freebies to help peddle its slanted results to gullible doctors.*[141]

5.2 In the UK, these same criticisms have been well rehearsed many times, most recently by the House of Commons Health Select Committee.[16] Yet there are several UK-specific issues that deserve special consideration, since they are particular cultural points of reference for future relations between industry, the NHS and academic medicine. First, healthcare costs. The DH agrees with the 2007 conclusion of the all-party House of Commons Committee of Public Accounts.[142] They estimated that at least £200 million per year could be saved from the drug budget without affecting patient care, simply by switching from branded to generic medicines. This saving represents 2.5% of the primary care drugs bill. The DH has stressed that it is for the NHS locally to determine how the savings released are reinvested in patient care. It may be that some or all are reinvested in other drug treatments, but as there is no separately identified NHS 'drugs budget' it is impossible to demonstrate exactly how and where these savings have been recycled. (One in five GPs say that pharmaceutical companies have more influence on their prescribing decisions than official professional advisors.) The renegotiation of the voluntary Pharmaceutical Price Regulation Scheme in 2008 (which began in January 2009 and will last five years) aims to achieve value for money for taxpayers and enable patients to continue to benefit from innovative products at a reasonable price. Some observers have claimed that the intention is to slash the NHS medicines bill by over £300 million annually.[143a] It will also support uptake of innovation through an innovation package agreed with industry. Yet an alternative view is that the financial envelope for medicines prescribing is too small. One example illustrates the point. NICE issued draft guidance in August 2008 arguing that although their experts agreed that four new drugs for advanced renal cancer (sunitinib, bevacizumab, sorafenib and temsirolimus) extended life by up to six months, these drugs were not cost-effective investments for the NHS. This decision likely affects at least 3,000 patients in England and Wales. The public debate about denial of access to proven clinically effective but costly new medicines is already a matter of profound public and political concern. While the Working Party could not provide a detailed analysis and review of the way in which medicines in the UK are judged affordable or not, there remains scope for important independent work to review the ways in which NICE measures cost-effectiveness. The concern over funding of new medicines is only likely to escalate, especially with such strong pressure to ensure that NHS spending on medicines represents good value to the taxpayer.[143b]

> ‘…there is still a very deep culture of putting waiting lists first… there has got to be a balance between the way in which we look after patients today and developing the improvements to healthcare over time rather than concentrating on the immediate short term. It is rather like eating the seed corn by diverting all of the R and D money into the frontline services.’
>
> David Cooksey (23 April 2008)

5.3 The second UK-specific issue is innovation. Given the often misinformed debate about the research productivity of industry, there are scientists who question the entire orthodoxy around the generation of intellectual property. John Sulston and Joseph Stiglitz, both distinguished Nobel Laureates, have led a frontal assault on cherished notions of patent law as a means to encourage and protect discoveries. They write:

> *…there is increasing concern that… [intellectual property rights] may, under some circumstances, impede innovation, lead to monopolisation, and unduly restrict access to the benefits of knowledge. We believe it is time to reassess the effect of the present regime of intellectual property rights, especially with respect to the area of patent law, on science, innovation and access to technologies and determine whether it is liberating – or crushing; whether it operates to promote scientific progress and human welfare – or to frustrate it.*[144]

5.4 With respect to pharmaceuticals, Sulston went further:

> *It is very clear that the present system of innovation for medicines is very inefficient and really somewhat corrupt. It benefits shareholders over patients, it produces for the rich market and not for the poor and does not produce for minority diseases.*[145]

Indeed, many would say that the lack of a ‘wall’ between commercial and research departments within industry has damaged not only the reputation of companies but also their ability to recruit talented scientists and discover new drugs. The truth is that we know little about the factors that determine innovation.[146] Our understanding of innovation is at an early stage and we should be humble and cautious in our statements about what kinds of scientific cultures and networks will support and accelerate new thinking.[147]

> ‘I do not accept the view that a purely market driven approach to the world is the one that delivers the most successful industry. There are analogues elsewhere: for an airline, safety is paramount. It may cost more, but an airline that does not have a reputation for safety is not going to last very long and I think the same applies in the pharma industry. It becomes a key commercial success factor.’
>
> Kent Woods (12 March 2008)

5.5 A third aspect of the present culture is the perception of a loss of trust in those who work for or with industry. To some critics, industry is variously seen as a biased informant,[148] an aggressive political player,[149] a poor medicines provider to those who need medicines most,[150] and a business weakly accountable for its actions.[151] Collectively, these practices risk damaging the integrity of medical science.[152] They have undermined medical professionalism,[153] and they may harm public trust in medicine.[154]

Pharma's view

5.6 The pharmaceutical industry's view is, understandably, quite different. Research-intensive drug companies see themselves as critically important contributors to patient care, medical science, employment and economic development. For example, Pfizer's Sandwich laboratories represent the largest pharmaceutical research and development site in Europe. At this one location alone, 3,500 people are employed across five main therapeutic areas: allergy and respiratory, pain, antiviral, genitourinary, and gastrointestinal and hepatology. They also have expertise in drug delivery, devices, inhalation, high-volume screening, vaccines, regenerative medicine, cardiovascular science, tissue repair and anti-fungals. The company's objectives are to fulfil high unmet clinical need, to be first or best in a particular drug class, and to be in areas of high market growth. In some fields, the UK is a particularly attractive place to invest – for example, in regenerative medicine and stem-cell research.

5.7 The pharmaceutical sector sees itself as a partner, stakeholder and supplier to the NHS. The role of doctors who work in industry – pharmaceutical physicians – is to be the voice of the patient. Their objective is to understand the pathophysiology of disease, to select drug targets, validate or disprove scientific hypotheses, establish risk-benefit analyses, obtain approval of new medicines, and show leadership. The main domains in which they work are clinical programme and trial design, trial execution, interpretation of clinical data, and publication. They see these as technical functions in which, as one company put it to us, 'The only model that counts is the patient.'

> 'The regulatory environment has made life much more difficult… increasing regulation has pushed industry away from the UK and from Europe, making it much more difficult to do trials…'
>
> Rory Collins (12 March 2008)

5.8 Not only does industry see itself as utterly focused on patient outcomes, it also sees itself as highly regulated, with multiple mechanisms in place to strengthen public trust and professionalism. The centrepiece of self-regulation is the ABPI Code of Practice for the Pharmaceutical Industry, which celebrated its 50th anniversary in 2008. The ABPI code reflects and goes beyond UK law. It includes requirements set out in other respected codes of practice, such as those from the European Federation of Pharmaceutical Industries and Associations and the International Federation of Pharmaceutical Manufacturers and Associations. The administration of the ABPI code is in the hands of the Prescription Medicines Code of Practice Authority (PMCPA). Complaints are dealt with separately from the ABPI, and subsequently published. The PMCPA has some sanctions (although of uncertain strength). In July 2008, the PMCPA suspended Roche from the ABPI for a minimum of six months for 'actions likely to bring discredit' to the pharmaceutical industry.

Constructing the culture

5.9 The unhappy and unproductive polarisation that currently exists between the pharmaceutical industry and the NHS is not helpful for patients or the public. Companies assertively defend their commitment to innovation, research and development, excellence and the contribution they make to the public's quality of life. Some critics, including some doctors, prefer to portray industry as being concerned only with excessive profit, corporate exploitation, overpricing, secrecy and too much power. This stand off needs to end. We need a new covenant between industry, the NHS and

academic medicine to take us beyond these caricatured positions. What might that new covenant look like?

5.10 For this Working Party, the Faculty of Pharmaceutical Medicine (of the Royal Colleges of Physicians of the UK), which has around 1,400 pharmaceutical physician members, set out six guiding principles for this new covenant:

- shared goals of improving patient care
- respect for the science base of industry, academic medicine and the NHS
- trust, transparency and partnership
- mutual respect among all individuals
- acceptance that there can be benefits for all sides working together, but with an understanding of realistic expectations: that the NHS needs new, safe, effective and cost-effective medicines (and medical devices); that academics need to publish good science; and that industry needs to make commercial returns on investments
- understanding of the legitimate needs of all groups and the overlap in both achieving delivery of a first class health service and in strengthening the UK economy.

'The organisation at the moment that is responsible for regulating the prestige NHS trusts in this country is not focused on excellence.'

Robert Lechler (23 April 2008)

5.11 The Faculty has also been the leading voice in setting ethical standards in pharmaceutical medicine.[155–8] However, one view expressed on the Working Party was that it is optimistic naivety to pretend that the motivation of clinicians, academics, politicians and industry scientists can all be elided in the interests of patients.

5.12 However, it seems fair to say that there has been a lack of productive strategic dialogue between the parties that should sign up to this new covenant. This lack of dialogue was underlined to the Working Party by JP Garnier and Andrew Witty from GlaxoSmithKline. They concluded that:

This [lack of dialogue] reduces most interactions to the purely transactional and does not promote openness, trust, and shared objectives. For many clinicians, their only direct contact with industry is with a promotional representative whose role, while important, is not widely representative of the many broad elements in the industry.

'I see the role of the MHRA as being much more outward facing and for very defensible reasons we need to strengthen our links with academic centres, research units, and the research activities of the UK.'

Kent Woods (12 March 2008)

5.13 In the research sector, the UK government has done a great deal to remedy this lack of strategic direction. The DH's Research and Development Directorate leads policy development in this area and, together with the NIHR (created in 2006 after publication of the government's NHS research and development strategy, *Best research for best health*[159]), is creating a better

environment to foster collaboration – for example, through the UK Clinical Research Networks. There is a wide and welcome commitment from many research-oriented partners, such as Cancer Research UK, to make these new initiatives succeed. Even more importantly, perhaps, is the high level discussion between the pharmaceutical sector and government through the Ministerial Industry Strategy Group (MISG). This group aims to implement recommendations that have a significant bearing on the UK environment for medicines, such as: the Long-Term Leadership Strategy, which MISG published in 2007; aspects of David Cooksey's review of UK health research funding; and parts of Ara Darzi's *Next stage review* that are relevant to pharmaceutical innovation.[52]

> 'Pharma is moving in the right direction, but it still retains some of the fundamental issues that it has always had… it finds it difficult working with the public sector and that includes both the NHS and the academic world. There is paranoia about intellectual property, which is ridiculous and nothing to do with real life.'
>
> John Bell (30 April 2008)

5.14 But there remains some way to go to achieve culture change for professional education and patient care. There are still, as Joe Collier put it to the Working Party, 'excesses' and 'inappropriate behaviour'. Nevertheless, Collier was clear about what needed to be done: minimise suspicion and conflicts of interest, maximise mutual advantages and trust, and impose realistic and relevant goals. These objectives dovetail with those from the Faculty of Pharmaceutical Medicine. They invite a much stronger commitment by all parties to transparency and communication. While transparency can never be a panacea and does not excuse inappropriate behaviour, it can create the incentives to raise standards across the entire sector. The Working Party was provided with several examples of how transparent explanations of working relationships with industry seemed likely to lead to strengthened trust. For example, the Royal College of Psychiatrists has made it explicitly clear that it has no pharmaceutical sponsorship for its Annual General Meeting. The British Thoracic Society has a strong code of practice for annual declarations of interest among society employees and members who sit on its committees and advisory groups. And the British Cardiovascular Society sets out clear guidance to its members on the presence of representatives from commercial organisations in clinical practice.

5.15 As Michael Rawlins told us, what is needed is wholesale cultural change. Instead of being defensive about collaboration, all actors should be more confident about cooperating, about celebrating success, and about taking advantage of what Robert Lechler called 'a golden moment' in the history of UK medical research. The UK needs to shift its attention from an obsession with processes and regulation, to a greater concern with patient outcomes. Doctors need to lead the profession out of a culture of dependency on industry – a dependency on gifts, hospitality and educational support.

> 'I think we can say that when NICE came into force it was an enormous change in the way we approached our business. Of course, you would expect resistance from the industry and over the past ten years while working together we have seen mistakes occur, but these have taught us how to engage in a more positive and transparent partnership going forward.'
>
> Nigel Brooksby (20 February 2008)

5.16 The medical profession can only extract itself from this culture of dependency by changing, together with industry, the value proposition of pharmaceutical medicine within the NHS. Instead of doctors seeing industry as a source of personal or professional financial support, practitioners must view industry as an equal scientific and clinical partner for improving clinical effectiveness, strengthening patient safety, and raising levels of patient satisfaction. Moreover, those who lead the NHS – politically and professionally – need to do more to support and value clinical staff. It is partly because the NHS fails to value doctors, while the pharmaceutical industry is good at expressing this value, that practitioners turn to industry and become dependent on its gift culture.

5.17 Ara Darzi's *Next stage review* stresses the importance of getting this culture right.[52] In Darzi's view, 'Innovation must be central to the NHS.' He takes the government's *Best research for best health* strategy as the foundation, and envisages two important additional developments. First, regional Health Innovation and Education Clusters will bring together providers of NHS services, universities, and the private sector. These will focus on innovations and improvements in patient care based on evidence and research, and raise the quality of healthcare education and training. Applications will be sought and awarded in 2008–9. Second, up to ten Academic Health Science Centres will be created. An international panel is being convened by the DH to designate Academic Health Science Centre status to those partnerships able to demonstrate the ability to compete globally.

5.18 Clinical pharmacology has the potential to be the spur to the creation of this new culture. It is true that the evidence this Working Party received was conflicting. There are as many definitions of a clinical pharmacologist as there are clinical pharmacologists. But the key point that unites this diverse group is a concern for medicines and how they are used. Within that broad church, some will prefer to work within translational medicine and early phase clinical trials; others in medicines policy; others allied to organ-based specialties; and others in education across undergraduate and postgraduate settings. Perverse incentives, such as the inexorable rise of specialisation and the research assessment exercise, have precipitated a crisis in the future of clinical pharmacology. This crisis needs to be tackled directly, by making safer prescribing a key educational objective throughout the working lives of doctors and by funding new research streams in clinical pharmacology, from phase I and II clinical trials to medicines policy. These educational and research incentives could encourage a new generation of young doctors to enter the ranks of a neglected yet critical discipline in medicine today.

> 'The truth is that, although there is great spin, the academic community has great difficulty even working in the NHS, let alone anywhere else, and it is a nightmare.'
>
> John Bell (30 April, 2008)

5.19 The RCP has an important part to play here by acting as a catalyst to accelerate the creation of new relationships. The College can do more to communicate the importance of research in the NHS, both independently of and together with industry; it can address the training needs of doctors interested in taking part in these collaborative partnerships; and it can do more to promote mobility between industry, academia and the NHS. In education too, the Working Party was told that the College had much to offer in drafting standards to manage potential conflicts of interest.

Medical journals: victims or assailants?

5.20 Editors of medical journals report examples of manipulation, distortion, bias, secrecy, overt promotion and ghost writing in publishing medical research. Editors sometimes sound like victims of corporate malfeasance, caught in an intense battle for publicity by sponsors eager to see their drug promoted and prescribed. The media often portray editors as being 'hoodwinked' by devious companies who see opportunities for marketing dressed up as science.[160] There are well documented examples of sponsors who seek to falsely attribute research papers written by company employees to supposedly independent academic authors.[161] This kind of dishonest practice – and it is dishonest – undermines the trust doctors and the public can put in the scientific record. Recent use of legal mechanisms by one pharmaceutical company to undermine the confidentiality and integrity of the peer review process has highlighted yet again how fragile and threatened are the means for robust independent critical appraisal.[162,163] And examples of marketing trials dressed up as rigorous research are now commonplace and are receiving greater scrutiny by journals.[164,165]

5.21 A contrary view is that medical journals are often a willing partner in fuelling the problems their editors complain about. Richard Smith, former editor of the *BMJ*, has argued that journals are little more than extensions of pharmaceutical marketing departments.[166] If editors really wanted to clean up the medical literature, they would stop publishing trials and simply critique them, he said. Editors, whether they admit it or not, preside over an imperfect system of journal publication. Drug advertisements are reported to be misleading.[167] Journals are not as vigilant as they should be about discovering serious conflicts of interest.[168] And editors are hypocritical about what they demand from authors, but hide about themselves.[169]

5.22 Editors have tried to sanitise their journals by raising standards of publication and by issuing periodic statements about the ethical principles underlying publication.[170] In 2001, editors of several general medical journals adopted new rules for disclosing information about conflicts of interest among authors, reviewers and editors.[171] Editors have tried to promote transparency by requesting clinical trial registration in advance of publication.[172,173] Groups that include editors have set standards for the unbiased reporting of trials.[174,175] And organisations have been created to monitor, evaluate and strengthen ethical standards of journal practice. For example, the Committee on Publication Ethics (COPE) is a forum for editors to discuss issues related to the integrity of the scientific record. COPE supports and encourages editors to report, catalogue and instigate investigations into ethical problems in the publication process.[176] The Enhancing the Quality and Transparency of Health Research (EQUATOR) network 'seeks to improve the reliability of health publications by promoting transparency, clarity and accuracy in health research reporting through the increased use of reporting guidelines'.[177] And finally, some 20 years after under-reporting research was first identified as scientific misconduct,[178] and after recent accusations that important trial data are being hidden from public view,[179] editors and scientists are at last grappling with how best to ensure that the findings of *all* clinical trials are made publicly available.[180]

A positive vision

5.23 Transparency and communication are the values around which a new covenant between industry, academia and the NHS must be written. Both values are increasingly seen as signs of good corporate and clinical practice – for example, in the registration of clinical trials and

publication of results. Add to those values an equally important set of behaviours – strong self-regulation and public accountability, medical professionalism,[181] more visible clinical and pharmaceutical leadership, mutual respect, better strategic planning – and a new culture conducive to high quality patient care, professional education, and productive research partnerships can be created. The evidence tells us that all parties in this covenant have lessons to learn and changes to make. Confidence, injected with a bolus of humility, should be our guiding feelings as we move to implement this culture.

5.24 Accordingly, the Working Party recommends that: **NHS institutions must do more to create a culture that values the links between patient care, professional education and medical research. Only by embedding the care-education-research nexus throughout the NHS will patients see the delivery of continuously improving and higher quality care become a reality.**

5.25 **The ABPI should change its Code of Practice to bring to an end the practice of industry representatives giving gifts to doctors and their support staff. Acting on this single recommendation alone would do much to rebalance the relationship between medicine and industry to one based on equality and mutual respect, with improved patient outcomes as the overriding objective of that relationship.**

5.26 **The Prescription Medicines Code of Practice Authority (PMCPA) should continue its annual code awareness campaigns and seek stronger collaborations with professional organisations, such as the RCP, to make sure they are a more visible feature of the professional landscape.**

5.27 **Doctors should take more seriously their responsibilities to report violations of the ABPI Code of Practice to the PMCPA, together with their responsibility to monitor their own and colleagues' alignment with the principles set out by the GMC in *Good medical practice*.**

5.28 **The MHRA should promote a stronger culture of transparency by opening their meetings to the public.**

5.29 **Medical journal editors should do more to strengthen public and professional confidence in the work they publish by joining and taking an active role in organisations such as the International Committee of Medical Journal Editors (ICMJE), the Committee on Publication Ethics (COPE) and the Enhancing the Quality and Transparency of Health Research (EQUATOR) network.**

5.30 **The RCP should create a Pharmaceutical Forum – to include physicians, scientists, research funders, industry representatives, editors and patient groups – to deliver and build on these recommendations and to create an appropriately collaborative culture between physicians and the pharmaceutical industry, with quality of patient care as the single most important outcome of their work. Ways to trigger a renaissance of clinical pharmacology should be a priority issue for this Forum.**

6 Future relationships

6.1 This Working Party has taken an optimistic view of the future relationship between the NHS, academia and the pharmaceutical industry. Transparency and communication, combined with a confident and more strategic exchange of ideas between these three parties, has the potential to create a flourishing research culture throughout the NHS, one that we believe will deliver benefits to all – especially to patients.

6.2 Leadership is central to this conclusion. Doctors, in particular, need to do more to speak up for the advantages of collaboration. Cynicism and poor practice in the past have fostered the wrong relationships: an unhealthy dependency among doctors on the largesse of industry and a negative view about the contribution the pharmaceutical industry makes to medicine and society. But there is no iron law that determines the future. Being wrong, unhealthy and negative is not inevitable. Each sector has something to learn from the other. Each has to change. Each should look for the good in the other and build on those positive attributes. Senior medical figures – such as the Chief Medical Officer, the NHS Medical Director, presidents of royal colleges, the chief executives of NICE and the MHRA, and the leaders of National Service Frameworks, to mention only a few, could do more to speak up for cooperation. This is the basis for the new covenant we propose.

6.3 Equally, senior clinical leaders within industry need to work harder to demonstrate and advocate the value that private sector research and development brings to public sector clinical care. The face of the pharmaceutical industry is currently bipolar: a chief executive, who usually appears in the business pages of newspapers to defend financial results, and drug representatives, whose primary concern is the promotion of a product to a doctor. Neither face is an accurate representation of the core activity of the pharmaceutical industry, which is to discover and develop new medicines based on insights into the pathophysiological basis of disease. And here, of course, there is total overlap and congruence with the purpose of medicine.

> ‘I think the time has come for a major reinvigoration of the collaboration between industry, academia, and medicine and the NHS.’
>
> David Cooksey (23 April 2008)

6.4 This upgrade in clinical leadership within industry will demand big internal cultural changes in some companies. It will mean greater public exposure (and so accountability). And it will mean industry having to be publicly responsive to movements within medicine – for example, in clinical trial registration and disclosing results.

6.5 The UK government will also need to act to create a more receptive environment for the evolution of these relationships. As Andrew Witty, the new chief executive of GlaxoSmithKline, pointed out, it is a cause for concern that there is no large biologics facility currently in the UK, especially when half of all drugs in development in a decade’s time are likely to be biologics. ‘The UK’s lead over the rest of Europe in biotech shrinks every year,’ he said.[182]

New priorities

6.6 Globally, disease profiles are going to change dramatically over a generation.[183] By 2030, mortality of children under five will have halved, while deaths from non-communicable disease will have risen to 69% of total world mortality. Deaths from HIV and AIDS will rise from 2.8 million in 2002 to 6.5 million by 2030. The WHO estimates that the major causes of illness will be AIDS, depression and heart disease. In simple terms, these are the three major challenges, not only for society, but also for an industry both responding to society's needs and exploring the likely highest areas of market growth.

6.7 In the UK, we can be even more precise. It is now widely agreed that the prevalence of Alzheimer's disease will hit one million by 2025, up from 700,000 today.[184] Diabetes prevalence is expected to rise from three million today to 4–5 million in future years. In terms of cost, experts expect the financial demand for cancer care in Britain to increase by 200% .[185] The UK will also see a greater absolute burden of heart and respiratory disease, together with mental ill-health.

6.8 UK data from Prescribing Analysis and Cost (PACT) reports reveal important future trends in general practice prescribing. In 2007, for example, prescription volume increased by 6% year on year, up from the previous year's growth of 4.5%.[186] Prescription costs also increased to £8 billion in 2007, a 2.1% increase on the previous year. Prescription volume increases were highest for endocrine (7.7%), central nervous system (7.1%) and cardiovascular (6.9%) medicines. For example, statin, proton-pump inhibitor, selective serotonin re-uptake inhibitor, insulin, and inhaled corticosteroid prescribing all increased substantially. The main forces influencing this growth in volume and cost were the Quality and Outcomes Framework (a system of financial incentives that is part of the GP contract), NICE guidelines, and repeat dispensing – trends that are expected to continue. Prescriber diversity is also accelerating. In 2007, prescribing by nurses increased by almost half (to 9.4 million items) and prescribing by pharmacists more than doubled (to 64,883 items). There are currently 8,745 nurse independent prescribers in England. The main categories of prescribing by nurses are penicillins (7.9%), wound management tools (4.5%) and emollients (4.4%). There are 471 pharmacist prescribers. Radiographers and optometrists have also recently been granted prescribing powers, and physiotherapists and podiatrists are now beginning to prescribe medicines.

6.9 An additional issue is the changing location of where medicines are consumed. A US study has shown an overall increase in fatal medication errors over a decade.[187] The largest increases were seen at home, especially combined with alcohol or street drug use. The authors of this study speculated that expanded consumption of medicines outside of clinical settings where there is little or no professional supervision may be increasing the risks of fatal medication errors. Reducing these fatal errors will require balancing professional attention between home and clinic. Patients may need to be evaluated for their capacity to manage their own medicines. They will certainly need education about safe medication use. And pharmacists may have an expanded role in the community for monitoring patient performance.

6.10 Industry will have its own view of the future. Sanofi-Aventis, for example, predicts that global vaccine sales will double by 2016. It plans to invest £3.5 billion in research and production of vaccines to meet this demand.[188] New categories of therapy, such as oligonucleotides, will eventually make a significant mark – a thousand clinical trials are currently underway to test their feasibility and effectiveness.[189] Children, for too long neglected by clinical researchers and pharmaceutical companies alike, will become an important new focus of attention.[190] Meanwhile,

health policy makers are increasingly influencing what doctors can and cannot prescribe. More care is moving into the general practice setting. Boundaries between specialists and GPs are being challenged.[191] And prevention is now higher on the agendas of health ministers. These trends are putting intense pressure on companies to adapt. As one analyst has concluded, 'The industry will need to make a seismic shift to facilitate further progress in the treatment of disease.'[192] These shifts are beginning to take place,[193] and, in the short term, they are painful. But the long-term results are likely to be favourable, at least for industry. In the USA, prescription drug spending is projected to double from $247 billion in 2008 to $516 billion in 2017.[194]

6.11 The NHS is also likely to change dramatically over the next generation. With the demise of the clinical pharmacologist will come the rise of the pharmacist. The loss of clinical pharmacologists is to be mourned and, where it can be, resisted. The birth of the discipline in the 1960s and 1970s arose out of the extraordinary productivity of industry and the need to test new drugs in healthy volunteers and patients.[195] Academic clinical pharmacologists also saw themselves as clinical scientists, investigating the mechanisms of disease and drug action. The clinical impact of pharmacokinetics was only then being appreciated. And the need for stronger scientific input into drug regulation was at last being recognised. Why clinical pharmacology has withered is not altogether clear. Some observers place the blame on the emergence of contract research organisations, while others suggest that the overly close links between clinical pharmacologists and industry may have fatally wounded their credibility. Yet clinical pharmacology remains robustly intact in isolated parts of the academic community.[196] And in 2008, the Wellcome Trust invested £11 million into four partnership research programmes between industry and academia – their Interdisciplinary Training Programmes for Clinicians in Translational Medicine and Therapeutics. This new money, matched by an equal amount from industry, is a welcome response to the decline in traditional clinical pharmacology.

6.12 Whatever the reasons for the fragility of clinical pharmacology, and despite our call for the creation of a new cadre of clinical pharmacologists, pharmacy is now seen as a new centrally important bridge between the clinician and the patient. In the white paper on the future of pharmacy services,[197] the government argued that, 'Pharmacists remain a significant untapped resource for delivering accessible services to the people who need them most.' The government wants to see more pharmacist-led clinical services, including pharmacists managing chronic diseases, and greater involvement of pharmacists in promoting the safe and effective use of medicines, healthy living and health literacy. The future is bright for pharmacists. The greater clinical status pharmacists will achieve should improve both access to, and the quality of, medicines use in the UK.

6.13 Finally, the UK has now entered a new era of growth in its funding for clinical trials.[198] The Efficacy and Mechanism Evaluations (EME) programme – a new collaboration between the UK MRC and the NIHR – aims to scale up the number of new trials funded by both organisations from 40–50 to 90–100 new studies each year. This doubling of capacity should have far-reaching positive effects on NHS standards of care. The programme will fund research that evaluates the clinical efficacy of interventions, explores mechanisms of disease or new scientific principles, and develops new research methods. The EME programme will not fund global health research, confirmatory or proof of concept studies, or animal-based science. The leaders of this new programme have pointedly challenged the UK's academic community to translate this massive new additional funding 'not just into increases in the number of publications, but also into clear benefits for patients'.[198]

The international scene

6.14 There is a global dimension to the future of relationships between industry and clinical-academic sectors. As we have already noted, the rapid explosion of new markets – for example, in China and India – is causing companies to rethink their research investment strategies.[199] A consensus now seems to be emerging that India and China will become new hubs for innovation, presenting interesting ethical challenges (adherence to ethics guidance, existence of research ethics committees, and authorship of research papers) as industry adapts to new research cultures.[200]

6.15 But the globalisation of pharmaceuticals also carries the risk of a backlash, one that is already influencing the reputation of industry in the UK. Several western critics of pharmaceutical companies argue that the industry has 'social responsibilities to the developing world', including research investments into diseases affecting low income nations, discounts on drug prices, and making medicines more freely available.[201] Others are sceptical that companies could ever seriously engage with low or middle income countries. 'Whatever the rhetoric about social responsibility,' Joel Baken writes in *The corporation*, 'whatever good works programmes the companies have in place… for-profit [pharmaceutical] corporations make drugs for profit. That's the bottom line.'[202] This highly reductive view of industry's motives may be unfair. In response to external criticism, but also to internal concern that the industry as a whole must demonstrate its legitimacy as a set of globally accountable institutions, companies have made significant efforts to move into the global health arena.[203,204] And the fruits of this new investment are beginning to ripen – for example, GlaxoSmithKline's candidate malaria vaccine.[205]

6.16 These successes also bring risks. Scientific discovery and translation are difficult, more difficult than perhaps the scientific community has itself understood and certainly more difficult than funders, the public and government understands.[206] The quest for an AIDS vaccine, for example, still eludes scientists.[207] Counterfeit medicines are polluting the global market of pharmaceuticals at dramatically expanding rates.[208] And industry is still fiercely criticised over its pricing policies for medicines in low income countries,[209] as well as the ethical standards of its trials in nations such as India, China and Russia.[210] In an effort to try to help pharmaceutical companies align themselves with emerging global attitudes to health, the United Nations Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health has devised draft guidelines.[211] These guidelines reflect the 'profound positive impact' that industry can have on issues of international health, and on its reputation at home. They cover aspects of management, public policy, research and development, patents and licensing, quality and technology transfer, price-discounting and donations, ethical promotion and marketing, clinical trials, public-private partnerships, corruption, associations of pharmaceutical companies, and monitoring and accountability. They too aim to rewrite the covenant between society, medicine and industry, but at an international level. His proposals deserve serious consideration by industry.

Next steps

6.17 These possible futures, by definition, remain uncertain. But this Working Party believes that each sector – NHS, academia and industry – has an urgent interest in making the culture and their mutual relationships work better for patients. This success cannot be based on evidence and exhortation alone. We need encouragement and evaluation.

6.18 We recommend that: **The RCP should hold a national conference in 2010 to review progress on implementing the Working Party's recommendations, and to continue to encourage and monitor the creation of a virtuous and productive relationship between the NHS, academic medicine and industry.**

7 Recommendations

Chapter 2 Patient care

- **The UK Departments of Health, representatives of the medical profession, regulators (the Medicines and Healthcare products Regulatory Agency (MHRA), and the National Institute for Health and Clinical Excellence (NICE)), industry and patient organisations should accelerate their work to debate, devise and develop an access-to-medicines strategy for patients in order to fulfil current unmet clinical need for prescription drugs, and to remove inequalities in medicines provision across Britain. This strategy could be initiated by the creation of a new Medicines Technical Advisory Group (MTAG), also involving the Department of Health (DH), representatives from primary care and hospital trusts, the MHRA, NICE, pharmaceutical companies, and professional and patient organisations.** (Paragraph 2.12)
- **The DH should develop a comprehensive medicines information strategy for patients. A first step towards such a strategy – to create independent sources of evidence about prescription drugs for consumers – should be to commission a freely available print and online British National Formulary (BNF) for patients. The BNF is a trusted brand and authority for medicines. Its extension, with DH support, to supply information to patients would be an important advance to empower the public.** (Paragraph 2.25)
- **The Royal College of Physicians (RCP) and the Faculty of Pharmaceutical Medicine, on behalf of the Academy of Medical Royal Colleges and the Royal Pharmaceutical Society of Great Britain, and working with the DH, should together devise, set standards for, and implement a policy for 'information prescriptions' about diseases and their treatment to be provided to patients with their prescriptions for medicines. This policy can be built around existing patient information leaflets produced by several organisations, including the RCP.[68,69] These prescriptions must be produced in partnership with patients or their representative organisations.** (Paragraph 2.26)
- **The RCP and the Faculty of Pharmaceutical Medicine should promote and apply the Seven Principles of Public Life among their fellows and members, and advocate these principles to the Academy of Medical Royal Colleges and the profession as a whole through the General Medical Council (GMC).** (Paragraph 2.27)
- **Manufacturers should make every effort possible to ensure that patients experience consistent presentation of medicines, so that the same medicine will always have a similar colour, shape and size of tablet, among other variables.** (Paragraph 2.29)
- **Pharmaceutical companies, encouraged by the Association of the British Pharmaceutical Industry (ABPI) and the British Generic Manufacturers Association, should review the packaging of their medicines to assist patients with visual or other physical difficulties.** (Paragraph 2.30)

- **The Royal Pharmaceutical Society of Great Britain, in collaboration with the DH and others, should accelerate its work to expand the role of pharmacists in the delivery of medicines and medicines information to patients. We propose that every clinical team, in primary and secondary care, should routinely include a named pharmacist.** (Paragraph 2.33)
- **NHS organisations and the MHRA should strengthen the system for doctors to report adverse drug reactions (including the computer software systems) by putting greater emphasis (in collaboration with the GMC and royal colleges) on the doctor's professional obligation to report adverse events at all stages of a medicine's life.** (Paragraph 2.38)
- **The MHRA should publicise and promote the system to enable patients to report potential adverse drug reactions online and/or in writing.**[95] (Paragraph 2.39)
- **The MHRA should launch a 'Yellow Card Day' to raise professional and public awareness about monitoring the safety of medicines in patient care.** (Paragraph 2.40)

Chapter 3 Professional education

- **Medical schools must take a stronger role in exposing students to medicines: their discovery, basic pharmacology, development, manufacture and delivery; medicines regulation; pharmacovigilance; the appropriate relationships between doctors and industry representatives (the Principles of Public Life); and the commercial aspects of the pharmaceutical industry. Once this curriculum has been developed, industry will have a valuable contribution to make to aspects of undergraduate teaching.** (Paragraph 3.20)
- **Medical schools' responsibility for the quality of prescribing among newly qualified graduates must be acknowledged more explicitly. We believe that a mechanism should be sought to introduce more standardised assessment across medical schools in order to test the prospective doctor's prescribing skills. This would offer the public a level of confidence and quality assurance about prescribing practices. We encourage its consideration.** (Paragraph 3.21)
- **There should be clear guidance to remove any uncertainties about students' interactions with industry:**
  - **All gifts by industry to students, including food and travel, should be prohibited.**
  - **Educational funds donated by industry should be disbursed by a centralised administrative unit, not by a company directly to a department or individual.**

  However, we believe that within these broad limits, the pharmaceutical industry does have an important and positive part to play in medical education. Industry has a distinctive voice that students deserve to hear. (Paragraph 3.22)
- **For the benefit of doctors in training, the royal colleges, the MHRA, NICE, the ABPI, and the GMC should together adopt a stronger role in promoting standards of safer prescribing and interactions between doctors and industry representatives.** (Paragraph 3.29)

- **The NHS should assume explicit and transparent educational funding responsibility for doctors in training – for example, through personalised and portable study leave and education budgets. The goal should be to wean the education of doctors in training off pharmaceutical industry support over a time-bound period, such as five years. All gifts to doctors in training, including food and travel, should end.** (Paragraph 3.30)
- **The NHS must collectively revitalise its role in supporting and disseminating evidence-based resources to strengthen postgraduate medical education. In addition to the commitments made to establish NHS Evidence as an extension of NICE,[52] an important first step would be to secure as soon as possible the long-term future of the BNF and to ensure that a hard copy reaches all doctors in the UK.** (Paragraph 3.37)
- **Relevant royal colleges and faculties, on behalf of the Academy of Medical Royal Colleges, together with the GMC, should convene a conference to define a framework, guidance and code of conduct about how doctors, NHS institutions and industry should work together to support postgraduate medical education. The intention would be to clarify the relationships between industry educational support for the individual, the department and the institution.** (Paragraph 3.38)
- **Employers must take greater steps to assume responsibility for prescribing quality after the Foundation 1 year. The Healthcare Commission – and its successor, the Care Quality Commission – should monitor the educational outcomes of NHS institutions.** (Paragraph 3.39)
- **New ways should be found to reduce the reliance of postgraduate medical education on sponsorship by pharmaceutical companies and the wider biomedical industry. Alternative sources of sustainable funding should be sought – for example, through the royal colleges and DH. In doing this, the implications for individual organisations such as royal colleges and specialist societies should be considered carefully.** (Paragraph 3.40)
- **In rewriting the relationship between medicine and the pharmaceutical industry, and in the spirit of a more balanced and mutually respectful partnership, all gifts to doctors, including food and travel, become untenable and should end.** (Paragraph 3.41)
- **The ABPI and its members should establish a pooled fund to invest in medical education. Such a fund would unlink financing from a single company, diminishing the perception of undue commercial influence and bias.** (Paragraph 3.42)
- **Any honorarium or fee, commercial or otherwise, paid to a doctor should be declared on a publicly accessible database. If the work being remunerated is completed in NHS time, that fee should be paid to the doctor's host institution to reinvest back into the NHS. If the work is conducted outside of NHS time, this payment should simply be made transparent. We urge the RCP, the Academy of Medical Royal Colleges and scientific societies to adopt this recommendation quickly. We urge employers to implement it in collaboration with professional bodies.** (Paragraph 3.43)

- **The ABPI should work harder to disseminate and implement its Code of Practice. We propose that the ABPI should organise an annual conference for medical professionals and policy makers to review the part that pharmaceutical companies play in shaping doctors' attitudes and behaviours.** (Paragraph 3.44)

Chapter 4 Research for health

- **Universities should demonstrate stronger leadership in seeking appropriate and genuinely integrated scientific partnerships with industry at all levels of their research portfolio, from basic science to clinical trials. Universities and the pharmaceutical industry should seek to widen the possibilities for joint funding of academic staff to work across both domains.** (Paragraph 4.12)
- **The Medical Research Council (MRC), National Institute for Health Research (NIHR), Wellcome Trust, Association of Medical Research Charities, and universities, together with the ABPI, should investigate the UK skills base for translational medicine with a view to devising and implementing policies to redress existing or projected skills gaps.** (Paragraph 4.13)
- **Professional organisations, such as the RCP, Academy of Medical Royal Colleges and Academy of Medical Sciences, together with their members and fellows, need to lead with a stronger voice: to support research collaborations between industry and the NHS that promote higher quality care, innovation and continuous learning; to work with the DH to devise incentives for NHS bodies and doctors to take part in research, especially clinical trials; and to partner more effectively with the research community to challenge the increasing regulatory bureaucracy that is eroding the UK's competitive edge in clinical trial research.** (Paragraph 4.20)
- **The MRC, NHS and Academy of Medical Royal Colleges must devise more effective ways for patients to learn about ongoing trials and, where appropriate, facilitate their participation in those trials. The MRC and the NIHR should also establish more transparent ways to include patients in their decisions about research priorities, from bench to bedside.** (Paragraph 4.21)
- **The NIHR should consider creating large patient registries as a means to conduct post-licensing safety studies after a new medicine has been introduced into clinical practice. Acting on this recommendation might be one tangible way to incentivise a currently weak safety research community within the NHS and universities.** (Paragraph 4.22)
- **NHS leaders, regulators, research funders, industry and academia must endorse and encourage more strongly and publicly a research culture in the NHS that is centred on improving the quality of patient care.** (Paragraph 4.28)
- **Every NHS and primary care trust should have a designated 'research champion' on its board. This individual's objective would be to advocate for research within their organisation and to encourage a culture where research is fruitfully and productively completed, including with industry.** (Paragraph 4.29)

- **Employers and professional organisations should consider ways to incentivise individual doctors who take part in research, such as protected time, excellence awards or Quality and Outcomes Framework (QOF) payments.** (Paragraph 4.30)
- **Those charged with allocating resources based on research output, such as the Higher Education Funding Council, should do more to recognise and reward academic-industry collaborative research, especially clinical trials.** (Paragraph 4.31)
- **Professional bodies with responsibility for postgraduate medical education (such as the GMC and royal colleges) should support and develop the notion of academia-industry modules or placements in the Foundation 2 training year. This would be a valuable means to promote and sustain a positive culture of collaboration between industry and the NHS.** (Paragraph 4.32)
- **The MRC and the Economic and Social Research Council (ESRC) should join together to fund the monitoring of outputs from different research funding models, especially those with industry, in order to optimise conditions for research and development of new medicines to fulfil unmet clinical need.** (Paragraph 4.33)

Chapter 5 The correct culture

- **NHS institutions must do more to create a culture that values the links between patient care, professional education and medical research. Only by embedding the care-education-research nexus throughout the NHS will patients see the delivery of continuously improving and higher quality care become a reality.** (Paragraph 5.24)
- **The ABPI should change its Code of Practice to bring to an end the practice of industry representatives giving gifts to doctors and their support staff. Acting on this single recommendation alone would do much to rebalance the relationship between medicine and industry to one based on equality and mutual respect, with improved patient outcomes as the overriding objective of that relationship.** (Paragraph 5.25)
- **The Prescription Medicines Code of Practice Authority (PMCPA) should continue its annual code awareness campaigns and seek stronger collaborations with professional organisations, such as the RCP, to make sure they are a more visible feature of the professional landscape.** (Paragraph 5.26)
- **Doctors should take more seriously their responsibilities to report violations of the ABPI Code of Practice to the PMCPA, together with their responsibility to monitor their own and colleagues' alignment with the principles set out by the GMC in *Good medical practice*.** (Paragraph 5.27)
- **The MHRA should promote a stronger culture of transparency by opening their meetings to the public.** (Paragraph 5.28)
- **Medical journal editors should do more to strengthen public and professional confidence in the work they publish by joining and taking an active role in organisations such as the International Committee of Medical Journal Editors (ICMJE), the Committee on Publication Ethics (COPE) and the Enhancing the Quality and Transparency of Health Research (EQUATOR) network.** (Paragraph 5.29)

- **The RCP should create a Pharmaceutical Forum – to include physicians, scientists, research funders, industry representatives, editors and patient groups – to deliver and build on these recommendations and to create an appropriately collaborative culture between physicians and the pharmaceutical industry, with quality of patient care as the single most important outcome of their work. Ways to trigger a renaissance of clinical pharmacology should be a priority issue for this Forum.** (Paragraph 5.30)

Chapter 6 Future relationships

- **The RCP should hold a national conference in 2010 to review progress on implementing the Working Party's recommendations, and to continue to encourage and monitor the creation of a virtuous and productive relationship between the NHS, academic medicine and industry.** (Paragraph 6.18)

Appendix 1

Those who gave oral evidence to the Working Party

16 November 2007	
Douglas Smallwood	Chief Executive, Diabetes UK
Jim Ritter	Professor of Clinical Pharmacology, King's College London
5 December 2007	
Joe Collier	Emeritus Professor of Medicines Policy, St George's, London
Fiona Godlee	Editor, *British Medical Journal*
9 January 2008	
Michael Rawlins	Chair, National Institute for Health and Clinical Excellence
Iain Chalmers	Coordinator, James Lind Initiative
20 February 2008	
Nigel Brooksby	President, Association of the British Pharmaceutical Industry
Jonathan Cohen	Dean, Brighton and Sussex Medical School
12 March 2008	
Kent Woods	Chief Executive, Medical and Healthcare products Regulatory Agency
Rory Collins	Co-director, Clinical Trial Service Unit, University of Oxford
2 April 2008	
Kate Webb	Principal Policy Advisor, *Which?*
23 April 2008	
Robert Lechler	King's College London
Aisling Burnand	Chief Executive, BioIndustry Association
David Cooksey	Chair of the review group to examine funding of UK health research
30 April 2008	
Marjorie Wallace	Chief Executive, SANE
Margaret Edwards	SANE
John Bell	President, Academy of Medical Sciences

Appendix 2

Written evidence submissions to the Working Party

Academic Medicine Committee, Royal College of Physicians
Peter Aitken
Swapna Alexander
Stephanie Amiel
Association of the British Pharmaceutical Industry
Association of Medical Research Charities
AstraZeneca
Andrew Bamji
James Barrett
BioIndustry Association
Luc Bonneux
TRC Boyde
British Association for Sexual Health and HIV
British Cardiovascular Society
British Dental Association
British Geriatrics Society
British Medical Association
British Pharmacological Society
British Society for Haematology
British Society for Rehabilitation Medicine
British Thoracic Society
Committee for Ethical Issues in Medicine, Royal College of Physicians
Edmund Dunstan
Faculty of Pharmaceutical Medicine
Jack Friday
JP Garnier and Andrew Witty, GlaxoSmithKline
Geoffrey Gill
A Gorski
David Griffiths
David Hackett
Mary Harrington
Paul Howard
Intercollegiate Committee of Haematology and Royal College of Pathologists
Michael Jenkinson
Joint Specialist Committee for Renal Medicine
Keele University School of Pharmacy, Department of Medicines Management
Roy Latham
Alison Leak
Anthony Lempert
Bernadette McKenna
Medsin
NACT UK Council
Novartis Pharmaceuticals
Ronan O'Driscoll
Michael Perelman
Gordon Peterkin, Scottish Centre for Telehealth
Pharmagossip
Ken Poole
Roy M Poses
Prescription Medicines Code of Practice Authority
Jacob Puliyel
Nick Ross
RJM Ross, School of Medicine and Biomedical Sciences, University of Sheffield

Royal College of General Practitioners
Royal College of Obstetricians and Gynaecologists, Ethics Committee
Royal College of Physicians of Edinburgh
Royal College of Physicians of Ireland
Royal College of Psychiatrists
Royal College of Surgeons
Philip Rutledge
Puneet Shukla
Richard Stenning
Chris Subbe
Charles Swainson
Pritpal Tamber
Tiago Villanueve
Wellcome Trust
Frank Wells
Andrew Whitehead
Hywel C Williams
Wyeth Discovery Research
CA Young

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