

Careers for Pharmaceutical Physicians

There are many career paths for medically qualified people in the British Pharmaceutical Industry. This article outlines the different roles available.

The Pharmaceutical Industry

- The Industry researches, develops, markets, manufactures and sells medicines for use in human and animal healthcare. There are two kinds of pharmaceuticals which are only available on medical/veterinary prescription ('over the counters') which can be bought by the public without prescription. There is a sub-group of OTC's which can only be bought from pharmacies, and not – for example – from supermarkets or drugstores
- The Industry is uniquely fragmented for one of its size and importance. Though there are very large firms in it, none has anything approaching commercial dominance over the others. For instance, the company with the largest sales to general practitioners in the UK has only about 6 per cent of the total market. However, within different broad areas of medicine, some companies may have a considerable percentage share of the market for a particular therapeutic group
- There are two kinds of company: those which are significantly research and development (R & D) based, and those which are principally marketing-orientated. Doctors are mainly interested in the former kind
- 'Research' means the discovery or design of biologically-active molecules which have not previously existed in a therapeutically-useful form. 'Development' means the process of formulation, evaluation and testing which takes place as a potential therapy moves from the laboratory towards the clinic. Research is usually carried out by chemists, biologists, and/or pharmacologists; most medical doctors work in one or more areas of development
- Industry statistics suggest that the research and development process for a new chemical entity ('NCE') normally takes between 8 and 12 years, and costs up to £800 million per compound for every 10,000 new compounds originated in the synthetic chemistry laboratories, between 8 and 10 get into human clinical trials of these, only one survives as a registrable (and thus, marketable) medicine and of these, about 1 in 10 is a commercial success – meaning only that it recovers its own cost of development
- Today, any company which is not in a position by the turn of the century to invest about 800 million per annum in research and development will not remain in the research-based end of the business into the second quarter of the twenty-first century. This sounds like a long-term statement, until it is considered in terms of normal drug development cycles: the turn of the century is between one and a quarter and two cycles away

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- Research-based pharmaceutical companies generally spend between 10 per cent and 15 per cent of their world sales turnover on research and development. On this ratio, even the very biggest companies' current ethical pharmaceutical sales volumes will not support a £3800 million per annum R & D investment. There is, therefore, a tendency for other divisions' profits (e.g. from heavy chemicals, toiletries and cosmetics or OTC pharmaceuticals) to be diverted to the ethical pharmaceuticals R & D budget. As a business proposition, this relies on the future prospect of better net profit margins from ethical products than from other product streams
- These days, no single country's pharmaceutical market (with the possible exception of the USA) can support the cost of developing a new medicine. Therapies must, therefore, be introduced on an international scale, with a view to more or less world-wide marketing in the longer term
- There is a very wide variation in the regulatory standards imposed by different governments which allow a drug to be marketed: some are extraordinarily tough, others are downright lax. In effect, if a therapy is approved by the Food and Drug Administration (FDA) in the United States, the DHSS in Great Britain, the Scandinavian and the New Zealand regulatory authorities, it will probably be registrable anywhere as long as it can be formulated to meet local preferences for mode of administration.

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Roles of Medical Practitioners

Essentially, the Industry employs five kinds of doctor, each with a very distinctive role. The larger the company concerned, the more likely it is to employ specialists. The smaller the company, the higher the likelihood that some or all of the roles will be combined in a small number of posts (or even a single post in extreme cases). The roles are:

1. The Medical Strategist:

A senior consultant/professorial level doctor with wide experience of clinical and pharmaceutical medicine. Probably 45-plus, with maybe 10 or more years' experience in the clinic followed by a further 10 years or so in a range of positions in the Industry, (s)he will almost certainly work at the company's world headquarters. His or her role, either single-handed or more likely, as a member of a multidisciplinary long-term planning group, is to have a vision of the future of clinical medicine, and to help convert this into a practical strategy for execution by the research and development division. These days, technology enables the Industry increasingly to design (as opposed to discover) therapeutically useful compounds. However, there is very little point in embarking today on a programme to develop, say, another beta-blocker for use in hypertension or another benzodiazepine tranquilliser for sleep disorders. So today, the Medical Strategist's role is to lead the company into more

promising fields, with a view to success in the strategic plan period-between 5 and 20 years hence.

2. The Clinical Pharmacologist:

Was probably a Research Registrar, Senior Lecturer or Reader before (s)he left academic/clinical medicine to join the Industry. If you went to visit this doctor at work you would probably know (s)he was a doctor monitoring drug levels or clinical signs in volunteers or specially selected patients. There might well be a secretary/receptionist to guard the gates and there would almost certainly be a nurse or two in the unit. If the unit was busy, there would be people in the beds, probably linked to various kinds of instrumentation. Or, they might be on exercise bicycles completing selfassessment ratings, just resting or even asleep.

The clinical pharmacologist's role is to characterise the activity of each potential new drug by reference to all relevant physiological or psychological measures; to understand its mechanism in the human species; to characterise its metabolism and kinetics; and to ensure (and monitor) its safety at the given dose. There will be continuing close cooperation within the Research Division's pharmacologists and toxicologists throughout.

If the compound is in Phase I development, this work will be done with 'normal healthy volunteers'. It is a phrase which can only be satisfactorily defined by saying that the trial subjects are people who have not been coerced into participation, and who do not anticipate any therapeutic benefit from taking the potential drug under test.

There are a few external constraints on a pharmaceutical company's decision to take a new compound into Phase I trials, but it is essentially a company matter. The decision to go into Phase I is the most awesome ethical decision that the medical, research and development staff have to take. As drugs get more sophisticated, more and more of their effects turn out to be species-specific, so that the fact that the mice, rats, guinea-pigs, beagles and baboons thrived in pre-clinical experiments is no guarantee of certain safety when first used in man.

The work suits 'hands on' doctors with good research minds and the industry usually hires people who have the same kind of academic and clinical track record in specific therapeutic areas which would otherwise qualify them in due course for a chair or a consultancyship.

Once a compound is in Phase II development, the work shifts from the company's (or a contract research house's/hospital's) laboratories and into the

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clinic, where the potential drug will be administered for the first time to patients anticipating therapeutic benefit. To do this work in the UK, a company needs external co-operation and consent e.g. from:

- government, who licence the trials
- the consultant or other physician who is caring for the patients concerned
- the hospital's ethical committee.

The patients themselves: usually few in number and subject to intensive monitoring under many parameters. In addition, there is the fundamental difference in Phase II that the pharmaceutical physician is unlikely to be involved in the hands-on work. This is delegated to the staff of the investigating centre.

Essentially, the Phase II work repeats and expands Phase I, but in addition it seeks to confirm that the compound works in the ways anticipated from pre-clinical and Phase I studies, and has (or has not) the potential to relieve or remove the target disease state.

The pharmaceutical physicians concerned are still essentially involved in research, still working largely in academic environments with colleagues and support staff who are like-minded. The Industry usually prefers to hire doctors whose experience, interests and achievements are similar to those of the Phase I physician, but with an added component of diplomatic skills, coupled with an ability to manage projects through other people who are not themselves subordinates or fellow-employees.

3. The Clinical Research Physician:

Assuming that all has gone well, and that the pre-clinical, first and early second phase work has confirmed that the company has a good potential therapy on its hands, the next major decision is to extend that Phase II work and go into Phase III trials whose aim is to satisfy the company, the governments in the target markets (and later, the profession and the patients) that the compound is effective and safe in the chosen indications and formulations.

In almost all-therapeutic fields, this means mounting studies in large numbers of patients (up to about 5,000) over long periods of time, so that the therapeutic hypothesis may be explored with more statistical power. Because of the economic considerations set out above, a late Phase II/Phase III trials programme is usually set up as an international project. The headquarters company delegates responsibility for the work to its local subsidiary

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companies, since their medical staffs are usually the people with the best understanding of national clinical needs. Generally speaking, there will be a 'core programme' of studies conducted to FDA or DHSS standards whose results can be used in many countries of the world, coupled with local programmes conducted to satisfy particular national regulatory requirements (for example, Clinical Trial Certificates (CTC's) or Exemption Certificates (CTX's) are required by the DHSS for each individual Phase III study conducted in the UK), or to test particular formulations/routes of administration which are special to the clinical preferences of the medical culture concerned.

There should not be too much new science emerging in Phase III, apart of course from effects that only come to light when large and long-term statistical samples are available for the first time.

Also, as the date for registration approaches, decisions of great financial importance are being made in other parts of the organisation, perhaps involving the building of new factories or the installation of new plant, the preparation of marketing plans, the printing of literature and the training of personnel.

It follows that in looking for clinical research physicians to work in Phase III trials. The Industry tends to be more interested in hiring candidates whose skills with people (negotiations, distance-management, diplomacy) practical experience of day-by-day clinical medicine, and ability to bring in results on time, perhaps outweigh their academic achievement and research-mindedness. But of course, the dream candidate would combine all these features.

4. The Medical Adviser/Medical Services Physician:

Once a compound has been registered and licensed for marketing, it enters the company's portfolio of drugs which are available for prescription by practitioners for their patients. The typical sequence for an entirely new therapeutic tool (e.g. recently, Triptans for migraine and Statins for cholesterol lowering) involves its adoption for regular use by academic and clinical opinion leaders, followed by broader acceptance by the hospital consultants and its eventual acceptance by the general practitioners. This process is rarely accidental, since it depends upon carefully-planned strategies which are put into action in the medical, marketing and sales departments of the companies concerned.

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The issues include:

- identifying the position that the therapy will occupy in various clinical environments promoting its acceptance in relevant sectors of practice
- preparing appropriate information packages to support the profession as they use it monitoring its progress in actual clinical use in Phase IV research studies (50 to 5,000 patients) and post marketing surveillance
- considering and developing new applications, dosage forms, etc
- maintaining a watch on competitor companies and compounds
- organising symposia, clinical meetings and so on
- in most companies, training of representatives and others in relevant aspects of e.g. physiology, pharmacology, ethics and medical practice.

The medical services physician's task is to understand the scientific and clinical background and to interpret this into clinical reality for the benefit of company colleagues, prescribers, dispensers and – where appropriate – patients. (S)he will normally work with a very wide spectrum of people, from professorial opinion leaders in academic institutions to junior clerical staff in the company. The precise requirements of recruiting companies will vary, mainly according to the shape of their product catalogue. Thus a company with a concentrated portfolio of specialist hospital products in e.g. oncology is likely to be looking for a specialist background, whilst a company with a broad portfolio of GP products is likely to be looking for a generalist. But whatever the background, an appetite for commercial involvement balanced by a genuine and ethical sense of professional self and real competence as a team player are likely to be prerequisites for success.

5. Other Medical Specialities:

Particularly in larger companies, there are also opportunities for doctors who wish to specialise in:

- Pathology, usually in the biological sciences sector of the research division, and typically as part of the toxicology department
- Medico legal affairs, especially where the company is operating in areas which render it more than usually sensitive to political, consumerist or media influence e.g., contraceptive medicine, infant nutrition, antiinflammatory
- Post-marketing surveillance/adverse event monitoring
- An emerging sub-discipline of particular interest to epidemiologists and others with statistical and analytical interests occupational medicine
- Often a postscript on the job description of the pharmaceutical physician, but a post in its own right in the very large organisation.

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Company types and management styles

In practice, each company is completely different from all the others, but there are some themes which doctors who are thinking of joining the Industry in the United Kingdom should consider.

- There are two kinds of company: headquarters and subsidiary. In general, unless the company is very large indeed, research and development up to and including mainstream Phase II trials will be entirely conceived and executed in the mother country. Late Phase II, much of Phase III and post-marketing trials/medical services will be the responsibility of local subsidiaries where they are big enough to support a medical department, or of itinerant headquarters staff where they are not
- There are two more kinds of company: British and foreign-owned. About 60 per cent of the British Industry is owned by foreign parent companies: mainly American, German, Swiss and French – though just about every country in the developed world is represented one way or another. The culture of the foreign-owned UK subsidiaries is often powerfully influenced by the nationality of its parent: On the credit side: British-owned companies tend to offer secure, predictable, but challenging and sometimes exciting environments to their staff. Americans have an enormous sense of fun, a driving purpose and a clarity about aims and objectives which enable ordinary people to perform extraordinarily well. You nearly always know where you are with the Germans and Swiss, who have deep respect for competence wherever they find it, and tend constitutionally towards long-term thinking. The French can have tremendous verve, style and panache, and are learning fast to think and behave internationally. Of course there is also a debit side. The various companies exhibit some of the national characteristics of the countries in which the parent companies are located but it is unwise to generalise as all the leading companies must necessarily be multinational in their outlook and only those who pursue long-term research and development policies will survive. The Americans, British, German and Swiss are all to be found among the top company's world-wide. On the horizon: are the Japanese, who by and large have no real corporate presence here, having preferred to license their extraordinarily productive pharmaceutical achievements to established drug companies, or to go into joint ventures with them
- Another important distinction is between big companies and small ones. The larger the company, the more likely it is to employ specialists. In the large company case, jobs will tend to be narrowly defined, with opportunities to work in great depth and to acquire expertise and perhaps a widespread reputation in the academic and clinical communities. The

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penalties might include being labelled as Company C Phase II CNS man and having little opportunity to influence the business as a whole.

In the smaller company, jobs will be broadly defined, with opportunities to work on a variety of projects over a wide range of fields and disciplines. The penalties are essentially concerned with the risks of becoming a Jack of All Trades, and hence being regarded (perhaps rightly) as a master of none. On the other hand, the chance to influence the company's direction will tend to be high for those who know how to take the opportunities that present themselves.

Why you might consider a move into the Industry

Pharmaceutical medicine has come of age in the last decade, with its own Royal College qualification – the Diploma in Pharmaceutical Medicine of the RCP – and its own professional association 'BrAPP', the British Association of Pharmaceutical Physicians.

The original Association was founded in 1957 to encourage professional development and organise training for doctors in the Industry. It has run many symposia covering technical and therapeutic areas of particular relevance to the pharmaceutical physician and many of these have been published. Together with the ABPI it negotiated the establishment of the Diploma in Pharmaceutical Medicine and formed a Joint Advisory Committee between the two bodies to over see the running of a training course leading to the Diploma examination. This is a two year course with 5 residential sessions each year, which aims to cover the core elements of the Diploma syllabus. However, being a post-graduate course, it is not all-inclusive and participants are encouraged to extend their knowledge by personal study and the attendance at other relevant courses.

Courses are organised and run by a number of organisations, such as the ABPI, the Medico Pharmaceutical Forum, University Departments of Clinical Pharmacology and a considerable number of specialist training organisations for the pharmaceutical and technical industries. In addition, Industry encourages its doctors to attend and participate in therapeutic area symposia and congresses, which enable them to be at the forefront of the advancing knowledge in their particular area.

The third, and most important, aspect of training is that which is done on the job. Instruction from senior medical and technical staff within an organisation is the basis of this, each covering their area of expertise by personal instruction or small group activities. The development of management and communication skills may also be covered in this way,

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or more formally by in-house or external courses.

We believe that there are now many more pharmaceutical physicians than there are, for example, full-time accredited cardiologists in Britain. Each had his or her own reasons for moving into the Industry: most started thinking about it in the face of a few negatives. NHS politics, bureaucratic interference, lack of recognition, short-term contracts, closing career opportunities, tiresome patients and expired challenges in practice are typical reasons but those who have made a successful transition have done so positively.

Typical among their objectives have been:

- getting to be part of a purposive and forward-looking enterprise
- putting themselves in a position where there is better feed-back about their progress and performance
- renewing the element of intellectual challenge in their daily lives
- freeing their personal and financial advancement from 'systems' constraints
- being at the leading edge of therapeutic progress and discovery
- having opportunities to build positive relationships in a much broader clinical and business community
- keeping professionally alive and up to date
- maintaining and expanding their personal commitment to the well-being of the largest possible number of patients
- having opportunities to travel, in the UK or internationally
- being able to influence the direction taken by important enterprises
- having fun.

The list is not exhaustive but the reasons we quote are the ones we hear most frequently from the successful doctors we know in the Industry. Note that nobody who matters gives much importance to shorter working hours, less pressure, less bureaucracy, more money for less work, freedom from worry, longer holidays, greater security or even the free provision of a company car. Individual companies may well offer some or all of these features, but they are not the basis of successful decision to make a radical career change.

- What is the job?
- Can I do it?

Without positive answers to these, question 3; Do I want to?; is entirely academic.

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What you can expect to get paid in the UK

The following section has been drawn up by a leading recruitment consultancy based on their experience of recruiting for Industry Clients and discussing possible changes of employment with medically qualified candidates who are already employed in the Industry. They suggest it would be sensible to expect a basic salary offer (inclusive of any bonus or profit share) of the order of 80-95 per cent of the NHS Consultants' salary range minimum for a 'starter' position in clinical pharmacology, clinical research or medical advisory work, depending somewhat on location. Maybe £31,000 to £32,000 more if you have achieved notable distinction in a specialist field of direct interest to the company, and £31,000 to £32,000 less if you are a relatively inexperienced physician. 80-90 per cent of the NHS Consultants' 3rd incremental scale point for a 2 to 5 years' experienced pharmaceutical physician, either on promotion or on a move to a new company (generally very inadvisable, in under two years).

- 85-100 per cent of the NHS Consultants' maximum after 5-10 years in the Industry, perhaps with the title of Senior Medical Adviser and responsibility for two or three support staff
- 90-115 per cent of the NHS Consultants' maximum (excluding Merit Awards) on appointment to a post as e.g. Head of Clinical Research, or Manager of Medical Services, responsible for the work of, say, two or three other physicians and half a dozen support staff.

Earnings compatible with experienced NHS Consultants with 'B' Merit Awards on appointment as Medical Director of a medium/large sized UK subsidiary of a typical American or European-owned company, responsible for clinical research, medical services, regulatory affairs and medical igormarion – a total team of say 15 to 20 people. Less in a smaller Company/Department; more in a very large one.

Few companies in the Industry operate fixed incremental salary scales of the kind which are common in the public service. Most decide about salary increases on an annual basis, using performance appraisal/merit and sometimes 'market factors' criteria to decide on each individual award. Some pay bonuses, in addition to basic salary sometimes 'fixed', say a 13th month's pay at Christmas, more often related to company profitability and personal performance. The big UK headquarters companies tend to pay upper quartile/upper octile in the market; subsidiaries of foreign parents are more conservative.

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This section may be rather encouraging, but when you are thinking about a job – any job – pay and ratios are a third level issue. You need to answer two questions clearly and positively before you worry about them:

- What is the job?
- Can I do it?

Without positive answers to these, question 3; Do I want to?; is entirely academic.

The Doctor as a manager

Just about every medical job in a pharmaceutical company involves its holder in the non-medical and managerial responsibilities of kinds they may never have met before. Their pay and status in the company reinforce the demand for managerial behaviour. In this sense, there are things about managing which doctors often don't perceive, let alone understand or do, mainly because clinical practice seldom involved them. Managing in Practice, means telling patients, nurses and ancillary staff what to do, then watching to make sure they do it and complaining if they don't. Only seniors – Professorial, Consultant and ranking purse-string holders – can use a behavioural shift. This is all to the good in Practice, since drugs and surgery have their limits, and the doctor's authority can deliver anything up to 50 per cent of the achieved relief. But it just won't do in any aspect of business medicine that involves getting results through other people. Here are the things most doctors need to take to heart, and learn to do:

- maintain commitment to company goals by planning, establishing and reviewing objectives, tasks and organisation structures which will help to meet the company's overall objectives as well as his/her own
- make sure that any activity or act is designed to enhance and maintain the company's image in the market place and community
- accept responsibility for his/her own work and that of subordinates and outside appointees' consultants, trial lists and so on
- manage all activities in ways that are consistent with the company's employee relations philosophy and policy
- perform regular appraisal/review with all subordinates and outside appointees so as to identify and be able to initiate action to improve performance – to further individual development and identify training needs
- work in positive and constructive ways with managers and professionals in other departments while maintaining individual ethics, integrity and commitment
- develop high quality problem solving skills and make use of the specialist

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- resources within the company and outside
- ensure the continued development and training of self and all subordinates so as to maximise their talents in meeting organisation objectives: using absence as a method of training possible successors
 - comply with company rules and procedures as well as operating within codes of practice concerning medical, technical, operational or personnel matters
 - ensure that the company operates within the spirit and letter of the law on those matters and in those territories for which you have responsibility and accept that those responsibilities can have direct legal implications for you
 - recognise that the company has obligations not only to its shareholders, but to its employees, suppliers, prescribers, patients and the general public and respect the interests of these groups in the conduct of the work
 - manage each area or project under his/her responsibility in such a way that objectives are defined, planned and communicated, that progress is monitored and the end results are evaluated.

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If none of these ideas alarm you, go back and read them again, because you need to think through their full combined significance. If all of them alarm you, you may be better sticking with clinical medicine, or looking at posts in the Civil Service.

Is there an exit?

If you enter the Pharmaceutical Industry and find it does not suit you, it is always possible to return to clinical practice, especially if you have a higher qualification. A doctor has gone back to the NHS after only two weeks in one case. He got so excited taking the Managing Director into hospital with an acute appendix that he did not come back.

Others have reached senior positions in the Pharmaceutical Industry before deciding on a change and returning to clinical practice. This is not so easy and a year or two off the NHS career ladder will have given your peers an opportunity to move ahead. Nevertheless, it can be done, particularly if one has kept up associations with medical practice. The holding of a clinical assistant or lecturer's post helps in such instances. Many companies allow their medical staff to do this, usually on the basis of a half-day session per week, the benefit to the company coming from the continuing medical experience for the Pharmaceutical Physician and the investigator contacts (s)he makes. Others have decided after some years working for a company that they would prefer to be independent, and have set up a consultancy or contract company on their own, or with colleagues, and have run clinical trials



for pharmaceutical companies which have insufficient staff, too many products, or both. Some are highly successful, but it can be very difficult to get started.

Another alternative, if you enjoy paperwork, is to join the Medical Secretariat of the Department of Health & Social Security. This is confidential work, assessing the Product Licence Application dossiers of all the drug companies and advising the Committee on Safety of Medicines or the Committee on Review of Medicines, or monitoring adverse reactions to all products as reported by doctors on yellow cards or in the journals.

There is an exciting, stimulating and rewarding career for doctors wishing to join the Pharmaceutical Industry. Most will be employed as pharmaceutical physicians primarily responsible for the clinical research and development and registration of new products. However, other fields are available from basic research to marketing and the most successful can rise to the top of the Industry, managing national and international companies.

Finding a Job in the Industry

The simplest way to find a job in the Industry is to watch the advertisement pages in the BMJ and occasionally other relevant journals) where the companies and specialised firms often advertise vacant posts. Direct approaches to companies are sometimes fruitful, even if they are not currently advertising but this can be something of a lottery.

Further Information

Further information on joining the Industry can be obtained from:

Association of the British Pharmaceutical Industry
12 Whitehall, London SW1A 2DY
Telephone +44 (0)20 7930 3477
Website at www.abpi.org.uk

British Association of Pharmaceutical Physicians
Royal Station Court, Station Road, Twyford, Reading RG10 9NF
Telephone +44 (0)118 932 0981
Website at www.brapp.org.uk

British Medical Association (Pharmaceutical Physicians Group)
BMA House, Tavistock Square, London WC1H 9JP
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