Education and training in internal medicine in Europe

H F P Hillen

Sir William Osler was the Regius Professor of Medicine in Oxford at the end of World War I. In those days there was a great demand for postgraduate medical education. This was the motive for the foundation of the Fellowship of Postgraduate Medicine, under the presidency of William Osler. Osler himself had received his postgraduate education in Europe, from 1872 to 1874, during a two year sabbatical in teaching clinics in Germany. It was during this period that internal medicine was introduced as a specialty in the schools of medicine in Berlin, Göttingen, and Vienna. Postgraduate education in these clinics was directed at the practice of clinical medicine and was based on the latest advances in physiology, bacteriology, and pathology. The switch from mere observation to understanding had been made.

William Osler was one of the first medical teachers who realised that this paradigm shift towards pathophysiology, from knowing to knowing how, had significant implications for medical education. He wrote about this on several occasions, and his main message was: do not try to teach the student too much, but give him good methods, and a proper point of view, and all other things will be added, as his experience grows. Self directed, problem based learning “avant la lettre”.

With this quotation by the most cited author on medical education, I thought that I could easily accept the invitation to present the Fellowship of Postgraduate Education lecture on the subject of postgraduate education in internal medicine in Europe. After all, internal medicine was invented in Europe, William Osler, respected in the Old and in the New world, had prescribed the teaching method already, and all I had just to do was describe the good methods and the proper point of view.

I completely agree with Osler’s point of view on medical education that it is not the burden of factual knowledge that is important, because knowledge is fleeting. What is important is to learn the methods for obtaining and applying knowledge, and to acquire a viewpoint on how to become the best possible internist for your patients and your public: that is the core of medical education in internal medicine.

I will, therefore, try to develop a point of view for the European internist, a blueprint of internal medicine founded on the philosophy of internal medicine, the present legislation, the practice of internal medicine in Europe, and on images of Europe. I will also discuss the method of good educational practice on the basis of the present training programmes and of concepts of learning.

A point of view on internal medicine in Europe

The main goal of postgraduate education in internal medicine is the making of good internists. For that purpose it is necessary to define what a good internist is, since a viewpoint on the principles and practice of an internist in the 21st century in Europe will obviously form the framework for present final requirements of postgraduate training.

The philosophy of internal medicine

As a consequence of the Cartesian philosophy, that man functions as a machine and that defects in this machinery cause illness, the science of internal medicine started in the middle of the 17th century with observation at the bedside with the description of diseases, known as nosography. Thomas Sydenham, who practised in London in 1655, gave clinical observation its place as a scientific method. In philosophical terms observational medicine is an inductive science, from observation of single patients or phenomena to general rules. Boerhaave, who taught at Leiden University at the beginning of the 18th century, was greatly influenced by Sydenham’s work on clinical observation. In Boerhaave’s textbook, *A Method of studying Physics*, sold in London in 1729 for the price of five shillings, an early mention of *medicina interna* can be found. At that time, Boerhaave’s influence as a clinical teacher was widely spread over Europe. Among his pupils was John Rutherford, who introduced clinical teaching to Scotland and became president of the Royal College of Physicians in Edinburgh.

The inductive method was further developed by the introduction of physical examination, percussion and auscultation, particularly in the Paris school of medicine during the period of Laënnec (1781–1826). Laënnec introduced the stethoscope to l’Hôpital Necker in 1819. Subsequently, clinical observations were compared with the findings of postmortem examination. In the 19th century, the pathological method dominated inductive observational medicine in the famous schools of Medicine in Paris (Laënnec), Vienna (van Rokitansky), and Berlin (Virchow). In the first half of the 19th century the scientific inductive method of internal medicine was extended in the direction of numerical reasoning, now called clinical epidemiology and...
evidence based medicine. Pierre Alexandre Louis developed Médecine d’Observation in 1830 in the Pitié hospital in Paris. Louis introduced the statistical method to medicine, describing the epidemiology of tuberculosis and fever. He conducted clinical trials that showed that blood letting does not work. The inductive science of internal medicine became a probabilistic or stochastic science. The second half of the 19th century was the time of the dawn of experimental medicine. In 1865, Claude Bernard published Introduction à la médecine expérimentale. Bernard introduced pathophysiological reasoning to medicine. Experimental laboratory research was done to find general rules of pathophysiology that could be applied to individual patients. In the philosophy of science, this is the deductive method.

The introduction of bacteriology and immunology by Pasteur and Koch, and the introduction of biochemistry to medicine by Justus van Liebig at the University of Giessen, and later Paul Ehrlich in Berlin, were along the same line of the deductive analytical method. At present, the great developments in molecular biology emphasise the influence of the deductive method in internal medicine.

The history of the philosophy of medicine shows a balance between inductive and deductive science. From the inductive observation of Hippocrates, Sydenham to clinical epidemiology; from the logic of Aristotle to Bernard, to the hypothetico-deductive method of Popper and to molecular biology. Both scientific methods have to be learned during postgraduate education. Just which of these two should have more emphasis depends on the time and on medical developments. It may well be that present trainees of internal medicine, who will work as internists in 2030 and beyond, have to learn much more about deductive molecular biology, the human genome and proteinome, than we now offer in our programmes (table 1).

But internal medicine is more than just induction and deduction. The real method of internal medicine is at the bedside, where the science and the art of internal medicine meet. Again, I quote William Osler: “Medicine is an art based on science”. That is the point of view he proposed for education in internal medicine.

Besides the inductive and deductive science, there is the humanistic science of internal medicine. Care for patients depends on the psychosocial circumstances of the patient and certainly, at this moment, on health care systems. Care for patients can only be given with an attitude of professionalism, with high standards of ethical and human values. Professionalism is such a core value of medicine that it was an integral part of the ancient history of European medicine. The physician-god Asclepius was noted for his devotion to healing the slaves and the poor, regardless of the size of their offering. It is very important that the European Federation of Internal Medicine (EFIM) works in close cooperation with the American Board of Internal Medicine (ABIM) on a project of professionalism. The EFIM and ABIM will certainly recommend including the training of professionalism in all postgraduate medical programmes.

Inductive, deductive, and humanistic science contributed to the progress of internal medicine, especially in the second half of the 20th century. But there is an extra layer of complexity in the health and disease of every individual patient. No one reacts in exactly the same way to complaints or illness. Because of this individual complexity, the skills of bedside medicine are vital for good doctoring. In this aspect, medicine and certainly internal medicine differ from the practice of any of the other applied sciences.

Bedside medicine involves the skills of observation, and of communication with individual patients, attention to individual reactions to disease, and pastoral skills. These aspects are especially necessary in elderly patients with multiple morbidity and in patients with unexplained disorders. It is in bedside medicine that the complexity of the practice of medicine is expressed pre-eminently.

Inductive, deductive, humanistic science and bedside medicine are all involved in the philosophy of internal medicine (table 2). Philosophies, however, are meant to find the answers to basic questions such as: “what is a good internist?”. Perhaps the most specific characteristic of a good internist is the competence of integration. Integration of empirical inductive, analytical deductive, and humanistic science at the bedside in a holistic approach to the care of patients with complex or multiple diseases, that is the heart of the matter of internal medicine. This integrative competence, even more than the clinical competencies, defines internal medicine and distinguishes internists from other medical professionals. And this competence of integration should, in my opinion form the foundation for postgraduate medical education (fig 1).

### The European internist
A practical view on internal medicine in Europe comes from a series of articles in the

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#### Table 1: The philosophy of internal medicine

<table>
<thead>
<tr>
<th>Method of observation</th>
<th>Pattern recognition</th>
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<tbody>
<tr>
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<td>Sydenham</td>
<td>Bernard</td>
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<td>Sackett</td>
<td>Popper</td>
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</table>

#### Table 2: Discipline of internal medicine

<table>
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<tbody>
<tr>
<td>Empirical</td>
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<tr>
<td>Clinical epidemiology</td>
<td>Molecular biology</td>
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The legal bottom lines for postgraduate medical education in Europe are a minimal duration of training of five years, six years in the near future, and the mutual recognition of internists’ diplomas.15

Images of Europe
Within the European Union there is a tendency towards complete economic and juridical harmonisation. The question is whether there should be further harmonisation of the specialist training. It is obvious that Europe has a precious diversity of cultures, languages, and “cuisines”. The economist Hofstede has published interesting results of research on cultural images of Europe.16

European countries are different in basic social characteristics, such as the acceptance of inequality or power distance, the acceptance of uncertainty or the level of anxiety in a society, the social roles of men and women, and moral values of rich versus good. Some countries are more feminine than others; many countries in Europe prefer the values of individualism above collectivism. European countries speaking a Romance language and the English generally have more masculine and more individualistic social characteristics than European countries with a Germanic language.

These characteristics not only produce a wide diversity but also have interesting relationships to health care. The Netherlands figures as the most feminine of the European Union countries, being sympathetic to the underdog and the individual, and the Dutch accept a certain level of uncertainty. According to Hofstede this social pattern is reflected in the Dutch attitude to drug addiction and the permissive attitude with regard to sickness leave from work. The British score high as individualists, and this may well be related to the problems they have with the National Health Service and with the ratification of the Maastricht treaty.

Images of Europe are also involved in the differences in the European countries with regard to the number of doctors, the number of internists, and the amount of the gross domestic product that is spent on health care. Images of Europe show a desirable diversity of societies and cultures. Internal medicine will recognise and cherish this diversity by its humanistic approach. Thus there is no need, it would not even be wise, to strive for complete harmonisation postgraduate medical education in Europe.

Good educational practice
In the days of Hippocrates the directors of training were highly spoiled by their trainees, as can be read in the second article of the oath.17

This picture is completely different now. Directors of training nourish the trainees, they offer attractive educational programmes and introduce to them—in addition to good clinical and good laboratory practice—also good educational practice (table 3). Trainers in postgraduate medical education do all this because they know that the only way to maintain high

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quality internal medicine is by high quality postgraduate education. This statement, however, is more an empirical observation than evidence based. In the ABIM report, published by Ramsey in the Annals of Internal Medicine in 1989, and in a recent paper by Taylor in the New England Journal of Medicine, the positive relationship between the quality of teaching and the outcome of health care is shown. In particular, the mortality of cardiovascular diseases and the mortality of hip surgery appeared to be lower in the larger teaching hospitals. 18 19 But I cannot find level I or II evidence for this claim.

Good educational practice should be based on the definition of the goals and objectives of the postgraduate training. Trainees and trainers have to be clear about the requirements that should be met at the end of a successful internist training. These final requirements can best be defined by the different national societies of internal medicine. The scientific societies are in the best position to define these final requirements in accordance with their views on internal medicine and with specific national health care demands.

Final requirements that were recently published by the Federated Council of Internal Medicine, the Royal College of Physicians in London, and the Danish and Netherlands Societies of Internal Medicine include several aspects covering the knowledge, skills, and attitudes of internal medicine. 20 21 The final requirements also include a list of diseases that are considered as “core” diseases, and on this list the level of competence per disease is stated.

With these final requirements in mind a core curriculum can be planned. This curriculum should be structured in such a way that final requirements of internal medicine can be met. The core curriculum for senior house officers in general internal medicine of the Royal College of Physicians in London is one example of such a structured curriculum. 21

Educational practice in internal medicine in Europe
Presently, about 14,000 residents are in training programmes for internal medicine in the 18 European Union countries. The duration of the training is five years in 10 European countries and six years in eight of the 18 countries. In seven of the 18 countries the curriculum includes some form of examination.

The curriculum is often structured in three phases: inpatient internal medicine, rotations, and subspecialty electives. A structure leading from general principles of internal medicine to detailed subspecialty competencies.
formal learning hours, trainees should have sufficient time and opportunities to study in a system of self-directed learning.

In June 2000 the European Commission passed a law on working hours for doctors in training. The average number of working hours a week was set at 48 after a period of transition. This law will put the balance between service and education under heavy pressure, unless our societies are able to solve the problems of manpower planning.

The last, but not least, aspect of good educational practice is assessment. From the science of learning we now know that assessment is of vital importance to any learning method. Formative assessment with feedback to trainees is especially useful in increasing the effectiveness of learning (table 4).

Table 4 Assessment: assessment is learning

<table>
<thead>
<tr>
<th>What</th>
<th>Who</th>
<th>When</th>
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<tbody>
<tr>
<td>Log book</td>
<td>Residents</td>
<td>Rotations</td>
</tr>
<tr>
<td>Formative assessment</td>
<td>Residents</td>
<td>Courses</td>
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<td>Role model, teaching</td>
<td>Staff</td>
<td>Yearly</td>
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<td>Curriculum</td>
<td>Programme director</td>
<td>Teaching hospital</td>
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<td></td>
<td>Site visits</td>
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Coming back to William Osler, I have tried to explore the point of view on internal medicine as an integrative science and I have advocated the method of good educational practice. Postgraduate medical education is a challenge for internal medicine in Europe because the more we succeed, the better the future of internal medicine in Europe.

2 Osler W. On the need of a radical reform in our methods of teaching senior students. Med News 1903;82:49–53.