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Perspectives in Medical Oncology

The Education of Medical Students About Cancer—Time for Change

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CANCER affects a quarter of the population of the developed world at some time in their lives, and it is the most feared disease. There is now, however, a growing recognition that a number of cancers are preventable and that others may be curable if diagnosed at an early stage. In addition, the management of patients with cancer is steadily advancing through developments in diagnostic and therapeutic technology, cancer chemotherapy and supportive care of the seriously ill. In the light of these advances, it is timely to discuss how medical students should learn about cancer. That they should receive some preparation for their future role in the care of patients with cancer is unquestionable, but by what means and by whom are difficult and contentious issues.

BACKGROUND

Traditionally, malignant diseases have been managed by a single discipline, selected according to the disease site and working in relative isolation. The diversity of speciality groups 'involved in oncology' has led to the recent debate about 'who should treat cancer' [1–3]. This debate stems from a concern that the best possible use should be made of existing and future resources for patient care. Questioning the cancer education of today's medical students is a logical extension of this debate. Undergraduate education must prepare the new graduate to play a full role in the care of patients with cancer, whatever the chosen medical career. It is the purpose of this paper to argue for changes in the curricula of the majority of medical schools so as to ensure that students will receive suitable cancer education and will see 'cancer medicine' as an important component of medicine as a whole.

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The term 'cancer medicine' is used in this paper to describe a unifying discipline covering pre-clinical, para-clinical and clinical aspects of cancer. It has developed because of the need to integrate and coordinate all activities relating to cancer. This is in contrast to the term 'clinical oncology', which refers only to clinical aspects and includes the sub-specialties of surgical, medical and radiation oncology.

THE PRESENT POSITION

An undergraduate medical course must provide the basis for training for careers in the whole range of medical specialties, including general practice. A doctor undergoing training for general practice is likely to receive little formal instruction in cancer medicine after his undergraduate years, although some family medicine training programmes include aspects of it, and therefore the undergraduate course must be comprehensive.

Departments of pathology and surgery dominate the undergraduate teaching of cancer in many medical schools. The involvement of epidemiologists, basic scientists, medical oncologists and radiotherapists is relatively small. This is unfortunate in an era when knowledge is increasing in the fields of carcinogenesis, tumour biology, radiobiology and the clinical pharmacology of anticancer agents.

The way in which undergraduates are taught about cancer varies from university to university, but in general reflects the relatively narrow interests of traditional disciplines which constitute only a small part of cancer medicine.

In recent years, diagnostic and therapeutic advances such as CT scanning, nuclear medicine, cancer chemotherapy and the hospice movement have increased the number of people who should

contribute to the curriculum on cancer. Such input either does not exist or is poorly coordinated. It is hoped that the development of academic departments of cancer medicine, clinical oncology or radiotherapy would provide this coordination. They have undoubtedly helped, but are often restricted by the rigidities of traditional curricula where time is precious. Loss of teaching time to another department is unthinkable, particularly when staffing levels are related to teaching commitments.

Cancer medicine is occasionally taught as an integrated discipline [4], but in many medical schools, students have non-structured teaching in the pre- and para-clinical aspects of cancer and little or no contact with patients being treated for cancer or with clinical oncologists. This means that the student will have little appreciation of the biology of malignant disease or the principles of its management and will have a poor understanding of the indications for and complications of different types of treatment. Knowledge of details of treatment is clearly irrelevant to the general practitioner, but an understanding of principles can only be to his/her patient's advantage. An informal survey of Australian and New Zealand medical schools and several in the northern hemisphere indicated that integrated teaching of pre-clinical, para-clinical and clinical aspects of cancer medicine was not an accepted part of the curriculum. The clinical component in a number of Australasian schools does not include contact with patients in the departments of medical or radiation oncology. Surgical aspects of oncology are taught in isolation, without a serious attempt being made to relate surgery to the other two components of clinical oncology.

THE NEED FOR CHANGE

The case for change must rest on how well the curriculum relating to cancer as it exists in most medical schools meets its goal of preparing the future doctor for a wide range of different medical careers. Are today's graduates as well versed in cancer and its many facets as in, say, cardiac or arthritic disorders? He/she must have the background to cope with problems of cancer management as they appear in the primary care situation. How well is the future general practitioner prepared for his role in cancer care? Let us consider the skills, knowledge and attitudes that he is likely to require.

Pre-clinical aspects involve an understanding of the role of common environmental factors in carcinogenesis, of the principles of genetics as applied to familial cancer and of the basic biology of the malignant process. Para-clinical aspects include understanding the epidemiology of common cancers, and understanding of the principles of screening and of public health measures leading to prevention and early diagnosis of cancer. In the clinical area, the general practitioner will be involved, at intervals, from the time of diagnosis to the time of terminal care and death. Many aspects of the process of diagnosis, staging and treatment of primary and recurrent disease will be carried out in the hospital environment. This does not mean, however, that the general practitioner will not have contact with the patient and his or her family. An understanding of the principles of management is necessary for general practitioners to fulfil their role in explaining, advising and reassuring the patient and family about events which are at times mystifying and frightening. Terminal care has developed as an important part of medicine in which the general practitioner can play a very major role.

Increasingly, general practitioners are being involved in the administration of chemotherapy, and this means a new range of skills must be acquired to ensure optimal patient care. The close collaboration of medical oncologist and general practitioner can do much to reduce the burden on the patient caused by repeated journeys to hospital. Perhaps most important of all is the need for all doctors to understand the emotions of the patient with cancer. Changed hopes, fears and aspirations make the cancer patient different from most others. These differences must be understood if successful doctor/patient communication is to be achieved.

The pre- and para-clinical phases often receive scant attention at the undergraduate level. As a result, the relevance of epidemiological information in terms of health education and screening for cancer is not appreciated. Yet the success of these measures to prevent or diagnose cancer early depends to a large extent on the active participation of general practitioners. Few undergraduates become proficient in teaching women breast self-examination or in taking cervical smears, or know the current recommendations about the optimal use of these measures. Unless a general practitioner has some understanding of the limitation of screening for cancer, screening may be misused or misinterpreted. A general practitioner may well be questioned about aspects of cancer aetiology and epidemiology. A member of the family has cancer—is it hereditary? How was it caused? Was there a risk relating to occupation? Is there a connection with trauma?

Clinical aspects of cancer diagnosis and treatment are covered patchily, with the greatest

emphasis being on surgical management. The importance of the integration of the three arms of clinical oncology is most unlikely to be appreciated by today's undergraduates.

Overall, we would argue strongly that these basic requirements are not met by the majority of medical schools. Perhaps the most striking deficiency in most curricula is the total absence of a coordinated plan to ensure that the three aspects referred to are given integrated coverage. This integration must surely be the role of the academic in oncology, but he can make a real change only if there is an adequate degree of flexibility in the medical curriculum.

RECOMMENDATIONS

It is clear to us that there is urgent need for the undergraduate curriculum to include integrated instruction in cancer medicine. Ideally, this would be achieved by the allocation of uninterrupted periods of time for this subject with great flexibility about content. This would allow for a wide range of teaching methods and clinical situations to be experienced. Examples would be visits to cancer registries, hospices and screening clinics. Such a course should be based on an academic department with a major interest in cancer and with suitable links with others involved in the clinical and non-clinical aspects of cancer. A department of cancer medicine would meet these criteria most readily, but in many universities such departments do not exist. If this applies ,the necessary experts may be found in the departments of medicine or surgery. The key feature would be the presence of academic staff members with a suitably broad view of cancer medicine and the enthusiasm to make the course successful. If cancer medicine as an entity cannot be found a place in the curriculum, a less desirable alternative is simply to ensure that the necessary content is included in a variety of courses mounted by different departments. In this case, the role of the coordinator for cancer medicine becomes more difficult, but just as important.

Table 1 shows a suggested plan for a cancer medicine curriculum with components in both clinical and pre-clinical years. It can be seen that a course such as this would require a large group of teachers from many disciplines. The role of the course coordinator would be a vital one. The most important component would be a positive and enthusiastic approach by all concerned so that the undergraduate participants would come from the course with a knowledge of cancer medicine as a vital and integrated discipline. It is this attitude that will lead to advances in the preventive aspects

Table 1. Outline of cancer medicine curriculum

Pre-clinical	Clinical
Biology of cancer:	Cancer diagnosis:
Carcinogenesis	Definition of high risk groups
Cell biology, kinetics, cell differentiation	Screening—benefits and pitfalls
The biology of tumour spread and metastases	Techniques for clinical diagnosis (with limitations)
An introduction to the biology of ionising radiation	Techniques for tissue diagnosis (with limitations)
Epidemiology of cancer:	The determination of disease extent and staging:
Statistics as applied to cancer and its treatment	Staging—rationale, techniques, limitations
Epidemiology of common cancers	Principles of TNM staging, investigations for detecting metastases
Cancer registration	Histopathological staging
Cancer as a life-style (preventable) disease	Staging and prognosis
Occupational hazards and legislation	
Health education about cancer	Cancer management:
Genetic aspects of cancer	Definition of objectives: curative, palliative
The principles of screening	Integration of treatment: medical and para-medical care
	Principles of cancer treatment: surgical, radiotherapeutic, medical and their integration
	Psychological problems associated with cancer
	Communicating with the cancer patient
	Assessment of results:
	Clinical trials
	Endpoints of therapy: disease free survival, absolute survival, cure, complete or partial remission, palliation, quality of life
	Terminal care:
	Hospital vs hospice vs home care
	Symptom control, team approach

of cancer and will ensure the highest standards of cancer care in the future.

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