

# Undergraduate Education About Cancer: a Survey in Australian Medical Schools

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**Abstract**—The goals of undergraduate medical education are to provide a core of basic knowledge, and a framework to permit further development of that knowledge. The structure of teaching and experience in cancer medicine should reflect the increasing importance of cancer in the community. Undergraduate teaching of oncology and its scientific bases is currently fragmented, and in some cases may be deficient. Until now, there have been few analyses of what is being taught about cancer at different medical schools. We have undertaken a survey of final year medical students or recently qualified doctors in Australia enquiring about their cancer education. The results indicated that substantial differences existed between the medical schools, and we therefore surveyed the teaching faculty in the schools to determine their view of the validity of the questions we used. Together these surveys showed that significant disparities existed between what the faculty felt should be taught and what students had actually experienced.

## INTRODUCTION

THE IMPORTANCE of cancer as a cause of morbidity and mortality continues to increase in many westernized communities. However until now there have been few analyses of what is being taught about cancer at different medical schools. In a previous article we have questioned the appropriateness of the cancer component of the present undergraduate curriculum [1]. The majority of cancer curricula are still based on, and sometimes restricted to, the specialties of pathology and surgery [2], and major developments in the biology and management of cancer have not always been incorporated into undergraduate teaching. For many doctors, the only formal education in oncology is as an undergraduate with almost exclusive concentration on therapy. Despite this, many public educational programmes about cancer rely heavily on general practitioners being aware of changing approaches in cancer prevention and detection in addition to management.

With the encouragement of the Australian Cancer Society, we have undertaken a survey of final year medical students or recently qualified doctors in Australia enquiring about their cancer education. Before conducting this survey, we wrote to the faculties of medicine in Australian medical schools

enquiring about their cancer syllabuses and also requesting permission to survey final year students. In several cases, no replies to our letters were received, and in others it was implied that such surveys were inappropriate or that there was no outline of the cancer curriculum available.

The results indicated that substantial differences apparently existed between the medical schools and we therefore proceeded to survey the teaching faculty in the schools to determine their view of the validity of the questions we used. Together, these two surveys indicated that significant disparities exist between what the faculty felt should be taught and what students had actually experienced.

## MATERIALS AND METHODS

In designing the questionnaire, we chose to include a broad range of cancer topics from exposure to laboratory cancer research to education about techniques for cancer screening, and aspects of cancer treatment including knowledge of methods of palliative care. We also enquired about familiarity with voluntary and governmental support services and cancer agencies. The questionnaire, which comprised 25 individual questions, some with several parts, could be completed within 2-3 min, and required only a 'yes' or 'no' answer to the majority of questions. In Table 1, the questions have been grouped according to subject matter rather than in

Table 1. We are seeking an evaluation of the undergraduate curriculum as it affects the teaching of oncology. We request your co-operation in answering the following questions as they reflect your experience of undergraduate teaching

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<b>A. Screening and cancer detection</b>	
1.	Were you shown techniques for the teaching of breast self-examination to patients?
2.	Were you instructed on screening programmes for breast cancer?
3.	Were you shown the technique for obtaining a cervical smear?
4.	Did you visit a screening clinic for: (a) breast cancer; (b) cervical cancer.
5.	Were you instructed as to the recommended frequency of cervical smear examinations?
6.	Were you instructed on screening programmes for colorectal cancer?
7.	Have you ever examined personally a case of: (a) breast cancer; (b) carcinoma of the rectum; (c) melanoma of the skin; (d) carcinoma of the mouth or tongue; (e) carcinoma of the lung.
<b>B. Cancer management</b>	
1.	Did you ever visit a Department of Radiation Oncology?
2.	Did you ever visit a Medical Oncology Clinic?
3.	Did you ever visit a Palliative Care facility?
4(a)	Where you ever present to watch an operation for cancer?
(b)	What was the cancer?
5.	Have you ever discussed the problems of palliative care with medical social workers?
6.	Did you receive instruction in techniques for pain control—other than the use of analgesics?
7.	Have you been instructed on the treatment of hyperkeratosis and skin cancers?
8.	Were patient support groups discussed with you, such as:
	— The Lost Cord Society
	— The Colostomy Association
	— The Breast Cancer Support Group
	— The Mastectomy Rehabilitation Service
<b>C. Curriculum balance</b>	
1.	Have you witnessed the <i>post-mortem</i> examination of a patient who died from cancer?
2.	In understanding the results of cancer therapy, were the following terms explained to you: fixed-term survival; median survival; curability; relapse-free survival.
3.	Was the emphasis when cancer was discussed on an anatomico-pathological approach?
4.	Were you taught about the biology of cancer in terms of: cell kinetics; growth factors; oncogenes.
5.	Were you instructed in the principles of: cancer surgery; radiotherapy; cytotoxic chemotherapy; clinical trials.
6.	Did you see any aspect of fundamental research in oncology?
7.	Do you believe that you were adequately instructed in oncology as an undergraduate?
<b>D. Cancer services etc.</b>	
1.	One Australian in four will develop cancer, one in six will die from it. Do you believe that the undergraduate course reflected these statistics in terms of time devoted to oncology?
2.	Did you visit a Cancer Registry?
3.	Was the role and function of the State Cancer Council discussed with you?

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the order in which the questionnaire was actually presented. The respondents did not identify themselves but they were asked for the name of their medical school.

The questionnaires were sent to cooperating clinical academics at major hospitals in Perth, Adelaide, Melbourne, Sydney, Newcastle and Brisbane, and these individuals were asked to distribute the questionnaires to the graduating year of students in 1985. In Melbourne, Sydney and Adelaide, permission to survey the students was delayed, and thus the questionnaires were distributed to all new interns commencing work in 1986 at major hospitals in these cities. Altogether 327 completed questionnaires were returned from an estimated 500 which were circulated. The proportion of students/interns from different medical schools who were asked to complete the questionnaire varied substantially, and the greatest proportion of the final year returning completed questionnaires was from Western Australia.

After we had received the completed questionnaires, it was clear that major variation existed between the students from the different medical schools, and we decided therefore to circulate the same questionnaire to faculty members of the major teaching hospitals. Faculty staff were asked to grade a 'yes' answer to the individual questions as very important, important, unimportant or unknown. The questionnaires were distributed to 55 faculty staff including the deans of clinical schools at the major teaching hospitals, and the heads of the clinical departments of medicine, surgery and obstetrics and gynaecology. Each respondent was asked to identify his discipline and style of practice. The questionnaire was not sent specifically to those with a particular oncological interest, although some of the surgical faculty contacted may have a particular interest in cancer. In addition, a questionnaire was sent to the College of General Practitioners. Thirty-five questionnaires were returned including one from the College of General Practitioners.

Table 2. Medical school affiliation of student and faculty respondents to the questionnaire

Medical School	Students	Faculty
Sydney	59	12
Melbourne	20	2
Newcastle	13	1
Adelaide	11	2
Western Australia	72	3
Queensland	18	4
New South Wales	70	1
Monash	4	1
Flinders	3	1
Unknown	57	8
Total	327	35

## RESULTS

Three hundred and twenty-seven completed questionnaires were received, including 87 from final year students and the remainder from interns. The numbers from each University Medical School are shown in Table 2 which also shows the medical school attachments of the faculty who also returned questionnaires. Faculty indicated their discipline and style of clinical practice as follows: academic 21, teaching hospital 9, administration 2 and others 3; general practice 1, medicine 13, haematology 2, surgery 10, other 8 (mostly gynaecology), radiotherapy 1.

The questionnaires have been analysed according to the number of positive student/intern answers to each question, and according to the importance given to the question being answered 'yes' by the faculty respondents (Table 3). Altogether, there were 25 individual questions, many with a single stem but with up to four components (Table 1). In presenting the data, the questions have been grouped according to the subject matter as follows: aspects of early detection and cancer screening, familiarity with cancer patients and their management, curriculum balance and lastly cancer services and statistics. The grouping of questions in this manner indicates that while student responses varied considerably, the highest positive response was to those questions relating to screening and cancer detection and the lowest to cancer services and statistics.

The significance of the individual questions as gauged by the faculty respondents also varied considerably with more than 15% of the respondents judging 14 of the questions as 'not important'. On the other hand, five questions were considered 'very important' by more than 50% of the faculty and a further seven questions 'very important' by between 25–50% of the faculty. By grouping of questions, it can be seen that 49% of the faculty judged questions relating to cancer screening and detection as very

important, compared to 28% and 26% of those questions relating to cancer management and 'curriculum balance'. The faculty judged a 'yes' answer as important in 85% of questions relating to cancer screening, 80% of questions about cancer management, 78% curriculum balance and 45% cancer services and statistics. These results suggest that, in general, the questionnaire was investigating relevant areas of undergraduate education about cancer as judged by the faculty respondents.

The majority of students answered in the affirmative those questions judged 'very important' by most of the faculty, but with the proportion ranging from 64 to 98%. On the other hand, several questions which between 25 and 50% of the faculty judged as very important were answered in the affirmative only by about half the students, e.g. familiarity with colorectal cancer screening by only 51% of students, visiting a radiotherapy department by 56%, and visiting a palliative care unit by 50%. There were some questions which the faculty gauged as 'not important', and yet produced high numbers of positive responses by students. For example, watching a cancer operation was gauged as not important by 41% of the faculty and yet was answered in the affirmative by 98% of the students.

## DISCUSSION

This paper describes an attempt to determine what students learn about cancer and how the cancer curriculum differs between medical schools in one country. We and others have previously expressed the view that how and what undergraduates learn about cancer may not reflect current knowledge of cancer biology or advances in its detection, diagnosis and treatment [1,3]. Undergraduate cancer education does not appear to have changed despite the creation in many medical schools of departments of oncology or cancer medicine [1, 3]. Partly this is due to increasing pressure on the curriculum from the creation of multiple new departments, and partly because cancer is shared by many preclinical and clinical disciplines.

The awareness in the community of cancer as a major cause of morbidity and mortality has increased in the last few years. Recent attention has focussed on early cancer detection, and it seems especially important that the future generation of doctors, particularly general practitioners, should be well informed about this area. They should also be able to assess reports relating to approaches to cancer prevention and developments in therapy. Moreover they must be aware of the existence of treatment options, many of which involve rather complex cost-benefit analysis.

After preliminary attempts to identify the cancer components in the undergraduate medical curricu-

Table 3. Results of the questionnaire. Questions have been grouped according to their subject matter

Topic	Question number*	Student/intern response % yes		Faculty assessment of questionnaire	
		Range+	Average	Total important	Very important/essential
Screening and cancer detection	1	54-92	64	94	56
	3	64-92	76		38
	3	97-100	98		44
	4a	5-29	18		6
	b	33-72	49		15
	5	98-100	99		50
	6	46-92	56		47
	7a	92-100	98		68
	b	68-94	80		59
	c	76-100	82		74
	d	61-100	80		56
Cancer management	e	85-100	96		65
	1	11-94	56	74	27
	2	33-95	56		24
	3	0-90	50		32
	4	92-100	98		15
	5	5-54	34		21
	6	46-74	65		56
	7	82-100	92		53
	8a	0-17	8		21
	b	15-77	40		21
	c	10-62	25		21
Curriculum balance	d	10-69	24		21
	1	27-93	59	85	44
	2a	14-46	31		15
	b	50-85	66		15
	c	29-71	62		15
	d	25-92	70		15
	3	73-91	80		12
	4a	45-97	82		21
	b	45-85	72		21
	c	45-100	75		21
	5a	94-100	98		41
Cancer services and statistics	b	89-100	95		38
	c	89-100	94		38
	d	72-92	80		44
	6	10-46	22		3
	7	35-54	45		24
	1	35-60	43	63	21
	2	0-9	34		0
	3	0-19	11		3

\*See Table 1; + range = variation in % responding yes between universities.

lum at some undergraduate medical schools in Australia, we decided to survey final year students using a simple questionnaire which, in our opinion, explored important components of the experiences and knowledge that a medical graduate should have at the time of qualification. While the student intern sample from some medical schools was small and not necessarily representative the responses to the questionnaire clearly demonstrated major variations between students, and suggested differences between medical schools (data not shown in detail).

Moreover, the faculty responses to the questionnaire indicate that, in many cases, there is a considerable discordance within the faculty, and between faculty and students in terms of what is thought to be important and what the students have, in fact, experienced. An earlier survey of 66 Queensland students in their final medical year investigated what they wanted to know about breast cancer [4]. The greatest needs were found to be details about early diagnosis and the treatment of early disease. 44% of the faculty in our survey felt that it was

not important that undergraduates learned about breast screening and this is reflected in the fact that only 5–29% of students, depending on university, did visit a breast screening clinic. It appears that the curricula which are currently in place do not reflect current thinking in cancer medicine nor do they fulfil the perceived needs of undergraduates.

It has recently been emphasized that doctors' attitudes and biases are formed at an early stage during training and may not be altered by post-graduate experience. Ambivalence to cancer medicine may lead in later years to obstruction of new approaches, e.g. breast conservation, clinical trials, or adjuvant chemotherapy [5, 6]. These reports highlight the importance of the cancer component in the undergraduate curriculum as a major determinant of life time approaches to cancer. Haley *et al.* [7] summarize the present position in their final sentence 'How can we teach positive attitudes in cancer prevention and early detection if the student has a year's experience in the *post-mortem* room to get over?'

Questions in our survey relating to cancer detection revealed major differences between medical schools. In Australia recent governmental concerns about the undergraduate curriculum have led to an

enquiry into medical education and the preliminary data we have generated should lead to more detailed investigation of the curriculum discordance in different medical schools in Australia.

In the University of Sydney, a survey of the final year examination short answer and multiple choice questions during the past three years has shown that about 30% of the questions in both categories can be viewed as having a cancer component. This observation clearly indicates that oncology forms a significant proportion of the final year examinations yet it is not formally taught.

Our pilot questionnaire obviously needs modification if it is to be more widely used in different medical environments. We understand that within parts of Europe a similar questionnaire based on our model may be used to survey undergraduates at different medical schools. It will be interesting to compare the results with ours, for we feel that our results indicate that there are major gaps in the clinical and basic science training as it relates to cancer in many Australian medical schools.

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