

Oncology Education in Medical Schools: Towards an Approach that Reflects Australia's Health Care Needs

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Abstract Cancer has recently overtaken heart disease to become the number 1 cause of mortality both globally and in Australia. As such, adequate oncology education must be an integral component of medical school if students are to achieve learning outcomes that meet the needs of the population. The aim of this review is to evaluate the current state of undergraduate oncology education and identify how Australian medical schools can improve oncology learning outcomes for students and, by derivative, improve healthcare outcomes for Australians with cancer. The review shows that oncology is generally not well represented in medical school curricula, that few medical schools offer mandatory oncology or palliative care rotations, and that junior doctors are exhibiting declining oncology knowledge and skills. To address these issues, Australian medical schools should implement the Oncology Education Committee's Ideal Oncology Curriculum, enact mandatory oncology and palliative care clinical rotations for students, and in doing so, appreciate the importance of students' differing approaches to learning.

Keywords Oncology · Cancer · Medicine · Education · Teaching · Undergraduate · Medical school · Health care · Australia

Introduction

“To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all.”
— Sir William Osler

Cancer has recently overtaken heart disease to become the number 1 cause of mortality both globally and in Australia [1], yet is still not a core clinical rotation in most medical schools. Australians are living longer than ever, and because cancer is positively associated with ageing, its incidence in Australia continues to rise. The oncology specialty has undergone rapid and remarkable change over the last 50 years, leading to significant improvements in the prevention, diagnosis, and treatment of cancer. A knock-on implication of such rapid change, however, is determining how to best teach and learn about cancer and integrating these principles into medical education.

Improving outcomes for patients affected by cancer starts with undergraduate medical education curricula. Because cancer has the ability to immensely impact every aspect of a patient's life, an ability to treat not only the disease but also the whole person must be a fundamental outcome of medical education. Such a patient-centred approach necessitates the presence of patients, yet most medical schools do not have core (mandatory) oncology or palliative care rotations in their curricula, nor do their curricula adequately weigh oncology in teaching time or assessment [2]. It must be questioned, therefore, whether medical schools are adequately addressing the medical needs of our population. As such, after reviewing the current state of undergraduate medical education in Australia, this essay will outline how integrating core clinical rotations and improving oncology curricula are essential steps to providing the best possible learning and teaching environment for cancer education.

The Current State of Undergraduate Medical Education

Australia's system of medical education was historically based on that of the UK's, which after decades of disorder, eventually evolved into what is today called a two-phase pre-clinical and clinical structure. Medical schools in Australia generally

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provide basic science education in the first 1 or 2 years through lectures, tutorials, and workshops that cover physiology, anatomy, pharmacology, and other key disciplines. For many medical schools, the problem-based learning model maintains its position as the glue that binds together each of these components, notwithstanding its oft-discussed limitations [3–5]. Clinical concepts are slowly introduced during this pre-clinical phase, and developing students are gradually exposed to patients in usually graceless clinical encounters. It is these patient encounters, however, that bring the basic sciences to life for medical students.

After completing the pre-clinical phase of their education, students become immersed in the clinical world of medicine, spending the majority of their time in hospitals, outpatient clinics, general practices, and community health organisations that focus on specialties chosen by universities. The clinical years of medical school provide an opportunity to apply basic science knowledge to dynamic, real clinical situations and environments. Equally important, students have the chance to learn and practice skills that cannot be mastered in classrooms or workshops. For example, ‘breaking bad news’, a theme often discussed in medical education [6, 7], presents a host of difficulties for the clinician as she or he grapples with how to provide distressing information to patients or families. Whilst pre-clinical education tells the student to, for example, avoid jargon and provide written materials, no amount of classroom teaching can fully prepare for managing distressed, sometimes despondent, patients. As such, the clinical years of a student’s education allow not just an application of knowledge but also the development of human skills and abilities that are essential to the doctor wishing to provide patient-centred care [8].

The Key Issues in Oncology Education

Oncology Is Under-Represented in Medical School Curricula

By the age of 85, half of Australian men and a third of Australian women will be diagnosed with cancer [9]. In 2013, more than 44,000 Australians died from cancer, and in 2020 alone, there will be 150,000 new diagnoses of cancer in our country [9]. Indigenous Australians have a 30 % higher cancer mortality risk, despite having a slightly lower incidence rate than non-Indigenous Australians [10]. Clearly, the impact of cancer in Australia is immense and should be reflected in the time devoted to teaching and learning about its management. However, it is not.

Effectively teaching and learning about cancer requires robust oncology coverage in medical school curricula, which continues to be an issue in Australia [11] and around the world (e.g. Canada [12], Poland [13], Greece [14], and Scandinavia

[15]). The poor uptake of standardised and properly weighted oncology curricula has been demonstrated in a study of undergraduate training programs [16] that showed oncology contributed to less than 10 % of the curriculum and final assessment for most medical schools, far less than its impact on health in society. Similarly, only three out of five European universities were found to have a stated oncology curriculum, and even fewer had departments of oncology [17].

The lack of adequate cancer education curricula has also been acknowledged by oncologists and students alike. In Argentina, four out of five oncologists believe that cancer curricula in universities are incomplete [18]. A review of oncology curricula in European undergraduate medical schools shows that only 20 % of fifth and sixth year medical students rated their clinical exposure to oncology as ‘satisfactory’ whilst over 40 % had received less than 20 h of total teaching time throughout their entire degree [2]. With over 14 million new cases of cancer worldwide in 2012 alone and a further 8.2 million deaths [19], the emphasis on oncology in medical schools is manifestly inadequate and a barrier to providing an environment for quality cancer education.

Oncology Education Is Lacking a Patient-Centred Approach

Historically, medical training up until around 1850 was exclusively delivered through an apprenticeship-based system [20]: on-the-job teaching with real patients, in real clinical environments. The following century saw a strong movement away from the apprenticeship approach as the scientific underpinnings of pathology emerged and subsequently relied heavily on a lecture-based approach [21]. Since around 1950, however, universities have again emphasised the importance of bedside teaching and clinical contact, by reducing the lecture component of education and focusing on delivering knowledge and skills through clinical experiences [21]. This change is grounded in research: though lectures may provide students with knowledge, the application of this knowledge to patients cannot be taught effectively through a lecture [21].

Whilst medical schools have acknowledged the value of clinical rotations for disciplines like psychiatry, women’s health, and paediatrics, they seem to have overlooked the importance of dedicated oncology and palliative care rotations. The Medical Deans Australia and New Zealand’s most recent publicly available report of medical undergraduate clinical training shows that in 2008, only two of 19 medical schools in Australia offered an oncology rotation as part of the core curriculum whilst a further two offered a core palliative care rotation [22]. As such, only around one in 10 students will experience dedicated oncology exposure in a clinical setting and another one in 10 will experience a palliative rotation, which is disproportionate, given the prevalence of cancer in Australia and the reality that almost all

doctors will be involved in managing patients with cancer at some stage in their career.

Doctors Are Exhibiting Declining Oncology Knowledge and Skills

The result of inadequate medical school curricula and clinical rotations in oncology and palliative care is inevitably found in our practising doctors. A survey of interns in Australia and New Zealand [23] comparing interns from 2001 to those from 1990 demonstrated that the 2001 intern group had received less exposure to cancer patients than those from the 1990 group. For example, less than half of the 2001 group had performed a physical examination on a patient with prostate or rectal cancer, fewer than the 1991 group. Similarly, an ability to perform a Papanicolaou smear had reduced in the 2001 intern group compared to the 1991 group, as had the ability to recognise melanoma lesions [23]. The authors also found that the 2001 intern group regarded their oncology teaching as being poorer than those in the 1991 group. With melanoma, prostate, and colorectal cancers accounting for three of the five most common cancers in Australia [9], a declining screening and diagnostic ability amongst Australian doctors is an unacceptable outcome.

As may be expected, the outcomes of limited undergraduate oncology education are also carried through to the careers of oncologists, with Australian medical, surgical, radiation, and gynaecological oncologists reporting via survey that a significant variability of knowledge and opinion existed as well as being overall poorly informed about cancer epidemiology [11].

Addressing the Key Issues in Oncology Education

Implement Curricula that Reflect the Health Needs of Our Population

In 1989, Australian medical schools received guidelines for an *ideal* oncology curriculum based on the outcome of a national survey about cancer education and published by the Australian Cancer Society [24]. After further research and the backing of the International Union Against Cancer, these guidelines eventually progressed into the *Ideal Oncology Curriculum (IOC)*, a set of guidelines made available to all medical schools almost 10 years ago by the Cancer Council's Oncology Education Committee. Despite this, uptake of the IOC by Australian universities has been limited [24] despite having many years to achieve integration, a reality perhaps more common in academia than we would like to believe.

More complete implementation of the IOC will provide medical schools with a solid framework for designing standardised, well-researched oncology curricula and will make Australia one of the few countries in the world with a coordinated effort towards national undergraduate cancer

education. The best way to teach oncology is to start with addressing the health needs of our population, which requires increasing cancer curricula in medical schools.

Implement a Patient-Centred Approach with Core Oncology and Palliative Care Clinical Rotations for Every Student

Oncology and palliative care rotations should be integrated as core rotations for every student during the clinical years of undergraduate medical education if we are to provide the best environment for teaching and learning about cancer. The addition of the 'five essential cancer clinical experiences for medical students' to the IOC demonstrates the importance of this hands-on, patient-centred approach to teaching and learning. They are as follows [24]:

1. Talking with and examining people affected by all stages of cancer,
2. Talking with and examining people affected by all common cancers,
3. Observing all components of multidisciplinary cancer care,
4. Seeing shared decision-making between people with cancer and their doctors, and
5. Talking with and examining dying people.

The IOC's essential clinical experiences, as expected, necessitate hands-on training with patients. The opportunity to talk with and examine dying patients is generally reserved for palliative wards, whilst being able to talk with and examine patients affected by all stages of cancer and all common cancers requires significant time in oncology wards or outpatient clinics. With the majority of Australian medical students missing out on rotations through oncology and palliative care wards and outpatient clinics, achieving the IOC's recommended clinical experiences becomes difficult, if not impossible. And, because poor coverage of specialties in the undergraduate curricula can lead to a decreased level of interest in those specialties [25], there are also implications for meeting the projected shortage of medical oncologists in Australia [26].

Breast cancer, one of the most commonly diagnosed cancers in Australia [9], has been shown to be better managed by students who have had clinical experiences with patients. A study of University of Western Australia (UWA) students [27] demonstrated that after the introduction of short clinical attachments in cancer medicine and palliative care during the clinical undergraduate years, interns were reported as being better prepared to care for patients with cancer, compared to the national intern average. Fewer UWA students responded that their training had been 'poor or very poor' when considering the management of incurable cancer or patients dying from cancer, and more UWA students reported that they

would refer a patient with a new diagnosis of breast cancer for multidisciplinary review. Multiple other studies have demonstrated that using actual patients in the delivery of breast examination education improves examination skills and breast lump detection (e.g. [28, 29]), further demonstrating the benefits of a patient-centred approach with clinical teaching and learning.

Excellent communication skills are essential for all medical students and are perhaps most important when dealing with patients with cancer. The IOC details a range of communication skills that are required for addressing the psychosocial aspects of cancer, counselling, patient education, and the communication of bad news. The development of such skills requires continued patient contact and could be achieved by having every student complete oncology and palliative care rotations in medical school. A review of reflections from University of New South Wales students [30] shows that after a 4-week oncology and palliative care rotation, students improved their communication skills by having the opportunity to ‘just listen’ to patients’ stories, allowing them to be empathetic and utilise communication strategies like ‘silence periods’. Students also recorded improvements in confidence in managing patients as well as enhancing their approach to providing whole-person care.

Recognise that Different Students Have Different Approaches to Learning

The huge variety in instructional preferences, cognitive styles, and learning styles observed in students dictates that the *best* way to learn and teach is to provide students with flexible, adaptable environments, such as those found in clinical rotations [21]. Whilst students are forced to adapt (with varying degrees of success) to their lecturers’ respective styles in the pre-clinical years, clinical rotations afford students a certain freedom around how they learn.

When on clinical rotations, it is common for students to attach themselves to clinicians who they perceive to be effective teachers, and avoid those who do not match their individual learning preferences [21]. Such a relationship is nurtured through the cognitive apprenticeship learning model, allowing students to articulate what they are learning to their mentor and to be coached by their mentors. It allows teachers to be good role models for students and, in return, provides students with someone to model their learning and behaviour on [31]. Being immersed in the clinical environment with both patients and clinicians also demonstrates the doctor-patient relationship to students, an essential learning objective [21]. Thus, clinical rotations in oncology allow each student to apply their individual learning styles whilst completing important learning tasks, providing them with constructive cancer education.

Conclusion

Cancer is the number 1 cause of death in Australia, yet our medical schools still have not modernised their approach to curricula and clinical rotations to better reflect the reality of twenty-first century health. Meanwhile, research from Australia and around the world confirms that medical students, junior doctors, and in some cases, specialist oncologists are falling behind in their understanding of cancer diagnosis, patient management, and clinical skills. Despite acknowledging the importance of patient contact in other specialties, medical schools still have not implemented core oncology or palliative care rotations for their medical students. Medical school curricula remain lacking in oncology content and assessment in spite of having one of the world’s oldest, most researched, and most developed guidelines, the Oncology Education Committee’s Ideal Oncology Curriculum. But, we must remain optimistic. Many of Australia’s medical schools are young and agile, possess the capacity to update curricula, and in conjunction with healthcare providers, implement oncology and palliative care clinical rotations, providing medical students and educators alike with the environment to best teach and learn about cancer.

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