



Medical Student Exposure to Cancer Patients Whilst on Clinical Placement: a Retrospective Analyses of Clinical Log Books

Darren L. Starmer¹

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Abstract

In Australia, one in two men and one in three women will be diagnosed with cancer by the age of 85. Several studies have demonstrated a decline in the number of medical graduates having examined cancer patients during their training. The aim of this study was to evaluate the exposure of medical students to cancer patients during clinical placements. Eighty-eight logbooks (response rate = 24.75%) containing 9430 patients were analysed. A total of 829 patients (8.79%) had a diagnosis of cancer. Most cancer patients were seen on surgical placements, whilst general practice placements returned the lowest numbers. None were seen in paediatrics or ophthalmology. Given the role surgery plays in the staging and treatment of cancer, it is unsurprising that most cancer patients were seen during surgery. Most concerning was the number of patients with common cancers seen by our students. Only 46% of students saw a patient with breast cancer. Even fewer saw patients with colorectal (41%), lung (32%) and prostate cancer (30%). Only 14% saw a melanoma patient. Variability in the quality of the logbooks is the main limitation of this study, and therefore, it is not a complete picture of cancer patient exposure. However, it builds upon previous studies by providing insight to the number and types of cancer patients to which students were exposed. Overall, the exposure to common cancers remains concerning and further research is needed to explore the type and quality of these interactions over the course of an entire year.

Keywords Medical student education · Clinical placement · Patient exposure

Background

Cancer is the leading cause of death in Australia [1]. Currently, one in two men and one in three women will be diagnosed with cancer by the age of 85 [2]. In contrast, mortality rates have declined over the past 20 years and the overall 5-year survival rate is currently 67% [2]. As a result, there are more patients living with cancer, highlighting the importance of adequately preparing our medical workforce with the necessary knowledge, skills and attitudes to care for cancer patients [3].

Exposure to cancer patients during medical school is believed to benefit the student, reduce misconceptions about cancer and impact positively upon patient outcomes and workforce issues [4, 5]. Unfortunately, several Australian studies have demonstrated a decline in the exposure of medical students to patients with cancer during their training

[4, 6–8]. More recently, medical students themselves have highlighted the need for improving cancer education [9, 10].

One of the limitations of the aforementioned studies is the reliance upon participant recollection of their clinical experience whilst medical students. For many students, their clinical learning and patient exposure extends over a period of three years. Further, the types of cancer included in the survey questionnaire was limited to just three in 1990 (melanoma, oral and rectal) [7] although this was increased to seven in subsequent surveys (breast, lung lymphoma, melanoma, oral, prostate and rectal [4, 6, 8].

The University of Notre Dame Australia's School of Medicine, Fremantle (SOMF) offers a four-year postgraduate medical degree, with an annual intake of approximately 105 students. Teaching in the final two years of the course occurs in a variety of clinical placements (including general practices, hospitals and clinics). Both the public and private sectors are utilised, across urban and rural locations. Whilst all students undertake a two-week placement in palliative medicine during their final year, there are no dedicated placements in medical or radiation oncology, or haematology. Therefore, exposure to cancer patients outside of the palliative care placement is opportunistic, depending entirely upon the clinical team to which

✉ Darren L. Starmer
darren.starmer@nd.edu.au

¹ School of Medicine, The University of Notre Dame Australia, PO Box 1225, Fremantle, WA 6959, Australia

each student is allocated. Whilst not compulsory, students were encouraged to keep clinical logbooks and to submit these for review, as part of the routine evaluation of the medicine course prior to 2017. One quarter of third year students undertake a clinical placement with the Rural Clinical School of Western Australia [11], where they spend an entire academic year in a rural or remote location. As such, these students are not part of the urban program and do not submit logbooks.

Study Aim

The primary aim of this study was to evaluate the exposure of medical students to cancer patients during clinical placements. A secondary aim was to compare the exposure of SOMF students with data for Australian and New Zealand medical graduates published by Barton et al., in 2003 [6].

Method

The study population was medical students on clinical placement at the SOMF during 2015 and 2016. A retrospective analysis of clinical logbooks submitted during this period was undertaken to identify encounters with cancer patients and the nature of the encounter.

Statistical Methods

Relationships between variables were examined via contingency tables and chi-square (χ^2) tests ($\alpha = .05$).

Results

Only 89 students submitted their logbook for the 2015 and 2016 calendar years, representing 25.00% of the 356 students undertaking clinical placements during that period. One student was omitted from the study as their logbook showed duplications and discrepancies with their rotation allocations.

Therefore, logbooks from 88 students were included in this study (response rate = 24.72%). The logbooks contained a total of 9430 patients, of which 829 (8.79%) had a diagnosed cancer and/or a past history of cancer. Only nine students submitted logbooks for both third year in 2015 and fourth year in 2016. The average number of cancer patients seen was 9.42 (range 0 to 91). More men were seen with cancer than women (52.35% versus 47.72%) and the mean age range of patients was 60–69 years.

When considering patients with a primary cancer diagnosis, lower GI cancers were most commonly seen (18.06%), followed by haematological (9.85%), upper GI (9.85%) and respiratory. The most common cancers listed in the past

medical history for patients were lower GI (13.66%), breast (13.66%), haematological (10.73) and male genital organs (9.26%) (Fig. 1).

When looking at individual student exposure, fewer than half had seen a patient with a common cancer. Comparisons with the study by Barton et al. [6], also demonstrated a low exposure rate of SOMF students to patients with cancer (Table 1). Of particular note is the low number of students who had seen a patient with melanoma (13.64%).

Students saw more cancer patients during their general surgery placements (232) which, when combined over years three and four, accounts for the longest clinical placement (eight and four weeks respectively). Additionally, a third of all ENT surgery patients seen had a cancer diagnosis. Unsurprisingly, the two-week palliative medicine attachment had the largest proportion of cancer patients logged per placement (98.19%). Only two of the 19 clinical placements (paediatrics and ophthalmology) did not include any cancer patients (Table 2).

Patients were fairly evenly distributed between public and private hospitals (55.33% versus 44.46%). Students were significantly more likely to encounter patients with colorectal, haematological, and head and neck cancer in public hospitals, whilst patients with prostate and lung cancer were seen significantly more frequently in private hospitals (Table 3). There are only two placements (palliative medicine and psychiatry) where students do not spend time in both the public and private system. However, no significant differences were noted for palliative care based upon the unit to which students were attached. The number of cancer patients seen in psychiatry was too small to meaningfully investigate further.

Only 14 students (15.90%) reported spending some time in a cancer service unit. Overall, 13 students logged patients in palliative medicine (29.45% of the 44 fourth year students). No student reported spending time in radiation oncology, whilst one student (1.14%) reported spending time in medical oncology and two reported spending time in haematology (2.27%). Despite this, haematological cancers represented the third highest number of patients logged (9.85%).

When excluding the palliative medicine placement, a total of 612 cancer patients were logged, representing 6.65% of the 9209 patients seen. Significantly fewer colorectal, lung, and head and neck cancer patients were seen in palliative medicine, whilst significantly more prostate cancer patients were seen in palliative medicine (Table 4). The majority of breast (41.9%), colorectal (81.6%), melanoma (31.3%) and head and neck cancers (89.2%) were seen whilst attached to surgical units. On the other hand, patients with haematological malignancies (70.6%) or lung cancer (36.6%) were seen predominately in general medicine placements.

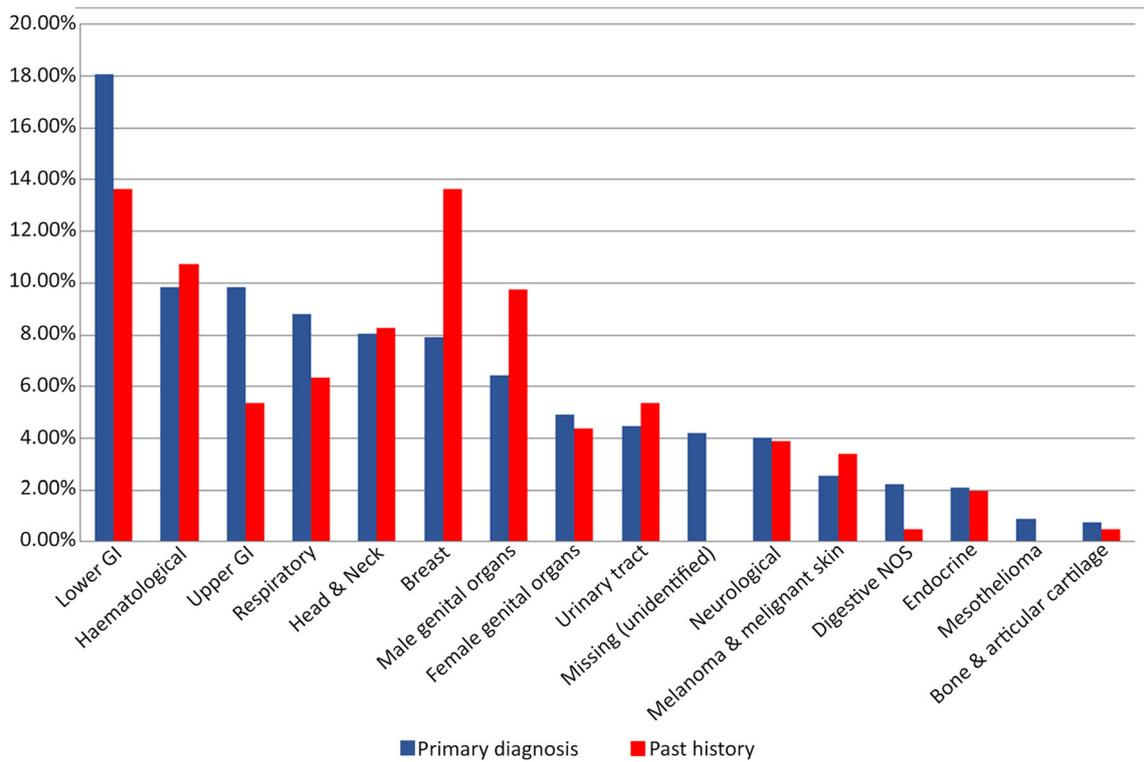


Fig. 1 Distribution of cancers by system

Discussion

On face value, the average number of cancer patients seen by medical students on clinical placement is encouraging, with only a handful of students having not encountered a patient with cancer. However, when the number of cancer types seen by individual students is explored, it is evident that less than half had seen patients with common cancers, and only a small proportion of students saw multiple types of cancer. When compared with the data for Australian and New Zealand medical graduates, SOMF students had seen considerably fewer cancer patients. However, it should be noted that the participants of that study had completed their medical training, whilst our data provides only a snap-shot of the clinical placements contained in the logbooks and is not a complete picture.

Given the vital role that surgery plays in the diagnosis, staging and treatment of cancer, it is unsurprising that the majority of cancer patients were seen on surgery placements. The large number of ENT patients seen is to be expected, given that all students spend two weeks attached to an ENT unit in their final year of medicine. This placement is undertaken at one of two tertiary teaching hospitals, accounting for the significantly high proportion of head and neck cancers seen in the public system. Surprisingly few cancer patients were seen in general practice (GP), which may be an indication of the level of interaction between the student and the patient (i.e. insufficient opportunity to take a history and/or time constraints) or the way in which the encounter was logged (presenting complaint only). Further, some patients logged in GP were being referred for investigations but a diagnosis of cancer had not yet been established. Exposure differences were noted between private

Table 1 Percentage of participants who encountered patients with cancer

Cancer type	Barton et al. (2001) <i>n</i> = 406	SOMF (2017) <i>n</i> = 88	χ^2	<i>df</i>	<i>P</i> value
Breast	93.8%	45.5%	134.463	1	< 0.001**
Lymphoma	80.0%	14.8%	142.629	1	< 0.001**
Lung	95.8%	31.8%	224.111	1	< 0.001**
Melanoma	80.3%	13.6%	148.735	1	< 0.001**
Prostate	41.3%	29.5%	4.079	1	0.043
Colorectal	N/A	40.91%	–	–	–

df degrees of freedom
 **Significant at $\alpha = 0.01$

Table 2 Patients logged by clinical placement

Clinical placement	Total patients (<i>n</i>)	Cancer patients (<i>n</i>)	Cancer patients (%)	Duration (weeks)	Total patients seen per week (<i>n</i>)
Third year (MED300)					
General medicine	1136	75	6.60%	8	142
General practice	864	15	1.74%	4	216
Obstetrics and gynaecology	742	17	2.29%	8	93
Ophthalmology	123	0	0.00%	1	123
Paediatrics	728	0	0.00%	4	182
General surgery	1127	85	7.54%	8	141
Fourth year (MED400)					
Anaesthetics	189	32	16.93%	2	95
Emergency medicine	467	15	3.21%	4	117
ENT surgery	310	83	26.77%	2	155
General medicine	538	86	15.99%	4	135
Geriatric medicine	212	5	2.36%	2	106
Intensive care	243	22	9.05%	2	122
Musculoskeletal	437	3	0.69%	2	219
Palliative medicine	221	217	98.19%	2	111
Psychiatry	261	6	2.30%	4	65
Rural general practice	1009	17	1.68%	4	252
General surgery	789	147	18.63%	4	197
Options†	34	4	11.76%	4	9
Total	9430	829			

† Students who participated in the Rural Clinical School in MED300 undertake a 4-week options placement instead of the 4-week rural general practice placement

and public hospital placements and these are most likely due to the fact that a number of clinical placements are only taught in public teaching hospitals. The remainder of placements are offered in both the public and private systems, and whilst most students will have the opportunity to experience these placements in both systems, some may only experience a placement in one. Palliative care is one example, where given the short duration of the placement, it is not practical to spend one week in a public hospice and the second week in a private facility. This is not an uncommon situation for a relatively small city

(population ≈two million) with two medical schools and limited clinical placements for medical students.

Excluding the palliative medicine placement data allowed the exploration of the opportunistic exposure of medical students to cancer patients, outside of dedicated cancer service units. The fact that more patients with colorectal and head and neck cancers were seen outside of palliative medicine is almost certainly due to the time spent in surgical units, especially in ENT surgery. Exposure to cancer patients is clearly influenced by the clinical placements to which each student is attached

Table 3 Patient exposure by hospital type

Cancer type	Private hospital	Public hospital	χ^2	<i>df</i>	P value
Breast	47.3%	52.7%	0.022	1	0.881
Colorectal	32.1%	67.9%	14.146	1	<0.001**
Lung	67.9%	32.1%	11.104	1	0.001**
Melanoma	53.8%	46.2%	0.289	1	0.591
Prostate	82.4%	17.6%	28.273	1	<0.001**
Haematological	20.7%	79.3%	26.233	1	<0.001**
Head and neck	6.3%	93.8%	45.425	1	<0.001**

df degrees of freedom

**Significant at $\alpha = 0.01$

Table 4 Patients seen in palliative medicine versus all other disciplines combined

Cancer type	Palliative medicine	Other	χ^2	<i>df</i>	<i>P</i> value
Breast	10.6%	9.2%	0.390	1	0.532
Colorectal	7.8%	22.1%	19.741	1	<0.001**
Lung	12.0%	5.6%	9.853	1	0.002**
Melanoma	2.3%	1.8%	0.217	1	0.641
Prostate	18.0%	3.4%	50.452	1	<0.001**
Haematological	6.9%	12.6%	5.219	1	0.022
Head and neck	0.9%	10.3%	19.474	1	<0.001**

df degrees of freedom

**Significant at $\alpha = 0.01$

and supports previous comments regarding the traditional teaching of cancer [12].

There are currently no mandatory placements in medical and radiation oncology, or in haematology at the SOMF and identifying students who spent time in these areas was reliant upon the student documenting this within their logbook. Only two students indicated that they spent time in haematology, despite 10% of all patients logged having a haematological malignancy as their primary diagnosis. Based upon the available clinical placements for general medicine, we know that approximately 24 students spend three half-day sessions with a medical oncologist in third year, and that 16 students spend two weeks in a haematology unit during their final year, so the low number of students identified as spending time in these areas is unlikely to be a true reflection of the actual numbers. No student reported spending time in radiation oncology and this is most likely to be the case, which is unfortunate given the important role that radiotherapy plays in cancer management, and it is often lacking in medical curricula and generally poorly understood by medical graduates [3, 13].

The benefit of time spent in cancer service units is not limited to patient exposure. Experiencing multidisciplinary patient management, observing the various treatment modalities and developing an understanding of modern cancer medicine are invaluable learning opportunities that will benefit both the student and their future patients. This is particularly important for those who will embark upon a career in general practice, as they will be increasingly called upon to aid cancer patients in understanding the available treatment options and to provide symptom management, including end of life care [3]. Importantly, the immersion in cancer service units has the ability to reduce commonly held myths and misconceptions. This has been observed locally, with the introduction of dedicated attachments in medical and radiation oncology, haematology and palliative medicine at the University of Western Australia in 2000 [8], which resulted in positive changes in the attitudes of junior doctors towards caring for cancer patients, with these doctors often requesting

placements in cancer service units after graduation (Dr. Joanna Dewar, Personal communication, April 2009).

There are several limitations to this study, with the main one being the variability of the data logged by each student. It was clear that the logs were not a complete picture of every patient encounter during their clinical placements and no student provided a log for the entire year. Nine students did submit logbooks spanning both years but this number is simply too small to draw any meaningful conclusions and neither year was complete. These factors will likely result in the number of patients with a past history of cancer to be underrepresented, due to the incompleteness of some of the logbooks. In some instances, only the presenting complaint was documented and in others only surgical procedures were included. Further, the majority of logbooks failed to indicate the nature of the exposure. Clearly the benefit to the student varies depending upon their level of interaction with the patient. For example, are students seeing patients pre- or post-operatively, or only intra-operatively; are they talking to and examining cancer patients or simply passive observers? Unfortunately, this study does not provide a complete picture of cancer patient exposure. However, it does build upon the previous studies by providing insight to the number and types of cancer patients to which students were exposed. Finally, only one quarter of the eligible students actually submitted their clinical logbooks. As such, this data does not provide a representative sample. In light of the small number of participants and the absence of data covering all clinical placements for all participants, statistical significance should be interpreted with some caution.

A second study is currently underway using a standardised logbook, with participants recruited to maintain this log for the duration of their clinical placements over the entire year. This logbook includes fields based upon the Cancer Council Australia's Ideal Oncology Curriculum's "five clinical cancer experiences", which are (a) talking with and examining people affected by all stages of cancer, (b) talking with and examining people affected by all common cancers, (c) observing all components of multidisciplinary cancer care, (d) seeing shared decision-making between people with cancer and their doctors, and (e) talking with and examining dying people ([14], p. 45). It is anticipated that this will provide valuable insight into the nature of the clinical encounters with cancer patients.

Conclusion

Whilst most students saw cancer patients during clinical placement, their overall exposure to cancer patients is less than that previously reported in the literature for Australian medical graduates. In contrast to previous studies, data obtained from these logbooks permits the number of cancer patients seen whilst on clinical placement to be examined, as well as the range of cancer types and the clinical placement in which they

are seen. The majority of cancer patients were seen during surgical placements. However, it is unclear as to the nature of these encounters and further research is needed to explore whether students are actively engaging with patients, or simply observing procedures.

Cancer education is particularly important in the setting of general practice, which remains the likely career path for a large proportion of medical graduates and one that plays an increasingly important role in the ongoing management of cancer patients. Regardless of their chosen career path, all doctors will encounter cancer patients, making it crucial that they possess the knowledge, skills and attitudes to provide high quality care.

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Compliance with Ethical Standards

This study received approval from the University of Notre Dame Australia Human Research Ethics Committee (approval number: 016180F).

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