

Palliative care clinical rotations among undergraduate and postgraduate medical trainees in Canada: a descriptive study

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Abstract

Background: The number of medical undergraduate and postgraduate students completing palliative care clinical rotations in Canadian medical schools is currently unknown. The aim of this study was to assess the proportion of Canadian medical trainees completing clinical rotations in palliative care and to determine whether changes took place between 2008 and 2018.

Methods: In this descriptive study, all Canadian medical schools ($n = 17$) were invited to provide data at the undergraduate and postgraduate levels (2007/08–2015/16 and 2007/08–2017/18, respectively). Information collected included the number, type and length of palliative care clinical rotations offered and the total number of medical trainees or residents enrolled at each school.

Results: All 17 Canadian medical schools responded to the request for information. At the undergraduate level, palliative care clinical rotations were not offered in 2 schools, mandatory in 2 and optional in 13. Three schools that offered optional rotations were unable to provide complete data and were therefore excluded from further analyses. In 2015/16, only 29.7% of undergraduate medical students completed palliative care clinical rotations, yet this was a significant improvement compared to 2011/12 (13.6%, $p = 0.02$). At the postgraduate level, on average, 57.9% of family medicine trainees completed such rotations between 2007/08 and 2016/17. During the same period, palliative care clinical rotations were completed by trainees in specialty or subspecialty programs in anesthesiology (34.2%), geriatric medicine (64.4%), internal medicine (30.9%), neurology (28.2%) and psychiatry (64.5%).

Interpretation: Between 2008 and 2018, a large proportion of Canadian medical trainees graduated without the benefit of a clinical rotation in palliative care. Without dedicated clinical exposure to palliative care, many physicians will enter practice without vital palliative care competencies.

Palliative care can be appropriate at any age and any stage of an incurable disease or of an advanced life-threatening illness, and can be provided along with curative treatment.¹ It aims to give patients and those close to them the support they need to achieve the best possible quality of life.^{2–5} Delivery of palliative care is a shared responsibility among all health care professions within all fields of medicine. However, only 25%–30% of practising physicians feel comfortable providing palliative care,⁶ and there is a shortage of trained palliative care providers in the workforce.⁷ In August 2013, the Canadian Medical Association adopted a resolution requesting that “all Canadian faculties of medicine create a curriculum for training in palliative care suitable for physicians at all stages of their medical education and relevant to the settings in which they practise.”⁷

To meet current and projected palliative care needs of Canadians, most physicians should receive clinical training in

palliative care,⁸ and clinical rotations are an essential component of this. The proportion of medical undergraduate and postgraduate students completing palliative care clinical rotations in Canadian medical schools is unknown. To evaluate the status of palliative care clinical training in Canada, we aimed to estimate the proportion of Canadian medical trainees completing clinical rotations in palliative care and to determine whether changes in palliative care clinical training have recently taken place.

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Methods

Setting and design

This was a descriptive study conducted between July 2016 and June 2018 in which all Canadian medical schools were invited to participate. There are 17 medical schools in Canada, distributed across 5 geographic regions: British Columbia ($n = 1$), Prairies ($n = 4$), Ontario ($n = 6$), Quebec ($n = 4$) and Atlantic Canada ($n = 2$). Medical training consists of undergraduate training (3–5 yr) leading to an M.D. degree, followed by postgraduate training (≥ 2 yr).

Data sources

We asked members of the Canadian Society of Palliative Care Physicians' undergraduate and postgraduate training committees to identify a representative responsible for palliative care education from each medical school to complete the data collection form (Appendix 1, available at www.cmajopen.ca/content/8/2/E257/suppl/DC1). One of the authors (F.J.) had multiple telephone communications with each school representative to provide support in completing the form.

Medical schools were asked to provide data for academic years 2007/08–2015/16 for undergraduate students, and 2007/08–2017/18 for postgraduate students. The following information was collected: type of palliative care clinical rotations offered (mandatory, optional), length of palliative care clinical rotations offered (in weeks), number of medical students enrolled each year, number of medical students who completed palliative care clinical rotations each year, whether the school offered an Enhanced Skills program in palliative care, number of residents who completed Enhanced Skills programs in palliative care each year, and number of residents who completed palliative care clinical rotations each year, by program specialty or subspecialty.

To determine the number of Canadian medical schools that offered mandatory or optional palliative care clinical rotations at the undergraduate level, we used data from 3 sources: information about the number of clinical rotations performed by students provided by the responding medical schools; for the nonresponding schools, curriculum information found on their faculty website, if available; and, if this information was not available, reports from the Association of Faculties of Medicine of Canada.⁹

We used reports from the Canadian Post-M.D. Education Registry¹⁰ and the Association of Faculties of Medicine of Canada⁹ as a standardized data source to determine the number of medical students and residents enrolled each year between 2007/08 and 2017/18. We also obtained data for a selected group of specialty and subspecialty training programs for which we considered palliative care to be particularly relevant (i.e., anesthesiology, family medicine, geriatric medicine, internal medicine, neurology and psychiatry).

Statistical analysis

The data collection form was intended to collect data at the individual trainee level. Some of the responding schools used it, but others provided data in a different format, so the data

had to be extracted by the research team. Owing to these format differences, only yearly and by-program aggregated analysis was possible. This allowed an estimate of the proportion of medical trainees who completed a clinical rotation from a given program in a given year. If trainees completed more than 1 rotation in palliative care, each individual rotation was counted. For each subgroup, the proportion of medical trainees for whom data were available over the total of medical trainees in Canada for this specific year was expressed as a percentage.

We defined complete data as the exact number of palliative care clinical rotations by year at both levels and by specialty at the postgraduate level. Nonresponding medical schools or medical schools unable to provide data on the number of palliative care clinical rotations were treated as missing data and were excluded from the analysis.

Data from medical schools were anonymized before being analyzed with Microsoft Excel 2013. We analyzed the increase in palliative care clinical rotations over time with the exact Wilcoxon 2-sample test using SAS 9.4 (SAS Institute).

Postgraduate clinical rotations

We calculated the estimated proportion of postgraduate trainees who completed a dedicated palliative care clinical rotation in a specific program or medical school by dividing the number of palliative care clinical rotations completed during a specific training year in the program or medical school by the total number of trainees enrolled in the program or medical school that year, then multiplying by the duration (in years) of the training program. For example, during the academic year 2009/10, for the 5-year anesthesiology program, 22 palliative care clinical rotations were completed among a total of 305 residents from the 9 responding schools that offered this residency program, leading to an estimated percentage of palliative care clinical rotations of 36.1% ($[22/305]*5$). The estimated percentage could exceed 100% if, on average, trainees in a given program completed more than 1 palliative care rotation in a given year.

Ethics approval

This study did not require formal ethical approval, as determined by the Research Ethics Review Board of the Centre hospitalier universitaire de Québec-Université Laval. Of the 17 medical schools, 16 agreed with this determination. The remaining site (University of Toronto) received institutional ethical approval.

Results

All 17 Canadian medical schools responded to the request for information and were able to confirm whether they offered palliative care clinical rotations within their institution. Nine schools used the data collection form.

Undergraduate trainees

Of the 17 schools, 2 (12%) did not offer any palliative care clinical rotations to their undergraduate students between

2007/08 and 2015/16, 13 (76%) offered rotations on an optional basis, and 2 (12%) included palliative care clinical rotations on a mandatory basis (starting in 2015 in 1 case). However, 3 of the 13 schools that offered optional rotations were unable to provide complete data and were therefore excluded from further analyses. The clinical rotations varied from 1 to 4 weeks among and within schools; some schools were unable to provide this information. Therefore, we did not compare the duration of the rotations between schools.

Among the 14 Canadian medical schools that provided complete data about their undergraduate medical students, an estimated 665 (29.7%) of 2239 students completed a clinical rotation in palliative care in 2015/16. Of the 665 students, 447 (67.2%) were from the 2 medical schools with mandatory palliative care rotations, 1 of which started to offer mandatory palliative care clinical rotations in 2011/12, and the other in 2014/15.

The estimated proportion of undergraduate trainees who completed palliative care clinical rotations increased significantly between 2011/12 and 2015/16, from 13.6% to 29.7% ($p = 0.02$) for all responding schools, and from 5.9% to 12.7% ($p = 0.03$) when the 2 schools with mandatory palliative care clinical rotations were excluded (Figure 1). In 2015/16, 1 of the 2 medical schools with mandatory palliative care clinical rotations was able to offer these rotations to only 71% of undergraduate students, for unknown reasons. Previous years (2007/08 to 2010/11) are not represented graphically because of insufficient data (see Appen-

dix 2, Supplemental Table S1, available at www.cmajopen.ca/content/8/2/E257/suppl/DC1, for details).

Postgraduate trainees

Enhanced Skills program

In 2017/18, 13 medical schools (76%) offered Enhanced Skills programs in palliative care leading to the College of Family Physicians of Canada Certificate of Added Competence in Palliative Care for family physicians.¹⁰ This is typically a 1-year program at the end of a 2-year family medicine residency.

According to annual reports of the Canadian Post-M.D. Education Registry, between 2007/08 and 2017/18, 208 family medicine residents completed an Enhanced Skills program in palliative care (Table 1). Despite a lower number of trainees in 2011/12 and 2012/13, the number gradually increased over the study period, from 9 to 24.

Selected specialty programs

Data for the postgraduate level were received from 13 medical schools for at least 1 year of the period 2007/08–2017/18. Of the 13 schools, 1 provided combined data for 2007/08–2016/17, and another provided data for 2016/17 only. Overall, data concerning palliative care clinical rotations were obtained from medical schools accounting for 41 292 trainees in specialty or subspecialty programs in family medicine (13 schools), anesthesiology (12 schools), geriatric medicine

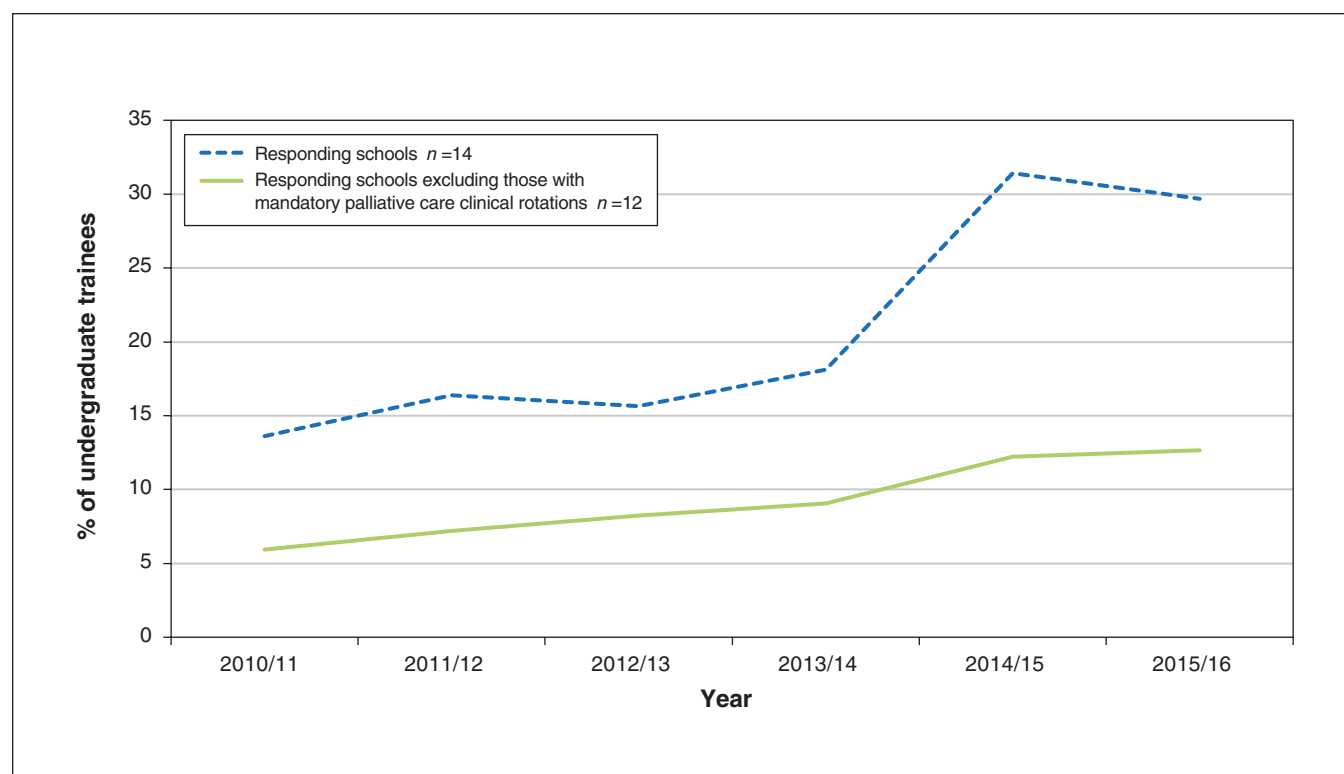


Figure 1: Estimated proportion of undergraduate trainees who completed palliative care clinical rotations at responding Canadian medical schools ($n = 14$) and at responding schools excluding those with mandatory palliative care clinical rotations ($n = 12$), 2010/11 to 2015/16.

Table 1: Number of family medicine trainees who completed Enhanced Skills programs in palliative care, 2007/08 to 2017/18

Geographic region†	Year; no. of palliative care trainees*											Total
	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	
British Columbia	2	3	3	2	2	2	2	1	4	3	0	24
Prairies	4	4	6	6	3	2	5	4	5	4	5	48
Ontario	3	3	5	10	8	3	12	12	12	13	14	95
Quebec	0	3	2	5	1	2	4	1	4	3	4	29
Atlantic Canada	0	1	1	1	2	2	1	0	2	1	1	12
Total	9	14	17	24	16	11	24	18	27	24	24	208

*Obtained from annual reports of the Canadian Post-M.D. Education Registry.¹⁰

†Atlantic Canada = New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador; Prairies = Alberta, Saskatchewan and Manitoba.

(11 schools), internal medicine (13 schools), neurology (9 schools) and psychiatry (11 schools), which corresponds to 68.9% of all residents in these specialties or subspecialties in all Canadian medical schools for the same period (see Appendix 2, Supplemental Table S2 for details).

Among the selected specialty or subspecialty training programs, 7505 palliative care clinical rotations were performed during training (Table 2). Psychiatry (64.5%), geriatric medicine (64.4%) and family medicine (57.9%) had the highest estimated proportion of residents who completed a dedicated

palliative care clinical rotation. In contrast, about 1 of 3 trainees in internal medicine (30.9%) and neurology (28.2%) completed a rotation in palliative care during their residency. Overall, the number of palliative care clinical rotations increased steadily over the study period for most of the specialty or subspecialty programs.

Table 3 presents the estimated proportion of family medicine residents who performed palliative care clinical rotations by medical school and by year. A total of 5488 palliative care clinical rotations were performed by family medicine trainees

Table 2: Number of palliative care clinical rotations and estimated proportion of residents completing such rotations by medical specialty or subspecialty and year, 2007/08 to 2016/17

Specialty/ subspecialty	Year; no. of rotations in each specialty (estimated % of residents who completed a dedicated rotation)										Total* [%]†
	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	
Family medicine	208 (44.4)	213 (38.7)	253 (42.4)	337 (45.9)	373 (48.4)	408 (50.2)	474 (52.4)	496 (51.6)	540 (54.4)	652 (54.8)	5488 (57.9) [69.9]
Other											
Anesthesiology	24 (49.8)	23 (41.2)	22 (36.1)	26 (35.9)	20 (27.2)	33 (46.9)	49 (62.0)	42 (54.0)	26 (34.6)	23 (30.1)	321 (34.2) [68.2]
Geriatric medicine	2 (30.8)	0 (0.0)	3 (60.0)	3 (50.0)	3 (75.0)	6 (92.3)	11 (88.0)	9 (60.0)	11 (66.7)	15 (68.2)	87 (64.4) [91.3]
Internal medicine	22 (18.4)	28 (18.2)	36 (20.9)	53 (27.4)	55 (27.5)	70 (35.4)	75 (34.6)	93 (42.6)	85 (37.9)	98 (35.8)	766 (30.9) [68.9]
Neurology	8 (55.6)	6 (33.3)	6 (29.1)	12 (49.6)	7 (26.1)	9 (32.8)	9 (33.1)	8 (32.0)	15 (54.3)	7 (26.5)	92 (28.2) [61.6]
Psychiatry	15 (24.8)	27 (37.6)	25 (33.5)	26 (33.2)	34 (46.7)	37 (49.3)	46 (52.8)	58 (63.5)	59 (60.8)	58 (47.4)	751 (64.5) [67.8]
Subtotal	71	84	92	120	119	155	190	210	196	201	2017 [68.1]
Total	279	297	345	457	492	563	664	706	736	853	7505 [68.9]

*Total for available years within the period 2007/08–2016/17 among responding medical schools.

†[%] = percentage of residents for whom data were available/total number of residents in each specialty or subspecialty, expressed as a percentage (see Appendix 2, Supplemental Table S2 for details).

Table 3: Number of palliative care clinical rotations within family medicine and estimated proportion of residents performing such rotations by responding medical school and year, 2007/08 to 2016/17

Medical school	Year*; no. of rotations in each school (estimated % of family medicine residents who completed a dedicated rotation)										Total†‡ [%]§
	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17†	
A	8 (10.6)	3 (3.8)	8 (9.5)	4 (4.1)	12 (11.6)	12 (11.7)	29 (27.1)	29 (25.9)	19 (18.5)	13 (12.3)	137 (14.1) [100.0]
B	17 (37.0)	13 (29.2)	20 (40.4)	18(33.0)	15 (27.5)	19 (36.2)	17 (30.1)	13 (21.1)	20 (32.0)	17 (26.2)	169 (30.9) [100.0]
C	15 (21.7)	17 (27.0)	29 (44.3)	26 (38.8)	32 (50.8)	14 (21.7)	17 (23.8)	17 (23.3)	28 (37.6)	19 (26.0)	214 (31.3) [100.0]
D				29 (35.6)	29 (31.7)	25 (27.9)	38 (46.9)	32 (34.4)	54 (51.7)	38 (34.7)	245 (37.7) [75.0]
E		11 (40.7)	10 (26.0)	9 (20.2)	13 (33.8)	12 (30.0)	16 (43.8)	20 (51.3)	22 (52.4)	20 (45.5)	133 (38.0) [96.8]
F							21 (36.8)	24 (38.1)	30 (44.8)	26 (37.1)	101 (39.3) [49.8]
G	19 (30.2)	13 (22.2)	38 (60.8)	33 (45.5)	41 (45.8)	51 (54.8)	39 (40.8)	47 (45.0)	49 (47.8)	47 (44.8)	377 (44.5) [100.0]
H		0 (0.0)	0 (0.0)	26 (34.7)	27 (33.3)	33 (37.5)	55 (64.3)	63 (72.0)	71 (77.6)	70 (68.6)	345 (47.5) [93.7]
I	48 (48.7)	44 (43.3)	45 (42.9)	74 (66.7)	75 (68.2)	90 (72.3)	88 (63.8)	93 (62.2)	97 (59.9)	108 (68.1)	762 (60.5) [100.0]
J	43 (85.1)	50 (93.5)	49 (86.7)	58 (93.5)	69 (104.5)	82 (101.9)	76 (81.7)	82 (88.2)	79 (81.0)	74 (76.3)	662 (88.3) [100.0]
K	58 (86.6)	62 (86.1)	54 (77.1)	60 (87.0)	60 (82.2)	70 (89.2)	78 (93.4)	76 (89.4)	71 (81.6)	89 (109.9)	678 (88.5) [100.0]
L¶											1534 (102.2) [100.0]
M										131 (73.4)	13 (73.4) [13.6]
Total [%]	208 (44.4) [55.4]	213 (38.7) [62.6]	253 (42.4) [63.0]	337 (45.9) [71.6]	373 (48.4) [70.2]	408 (50.2) [70.2]	474 (52.4) [73.9]	496 (51.6) [74.7]	540 (54.4) [74.5]	652 (54.8) [87.5]	5488 (57.9) [69.9]

*Years for which the number of rotations was not provided from the medical school are left blank.
 †Estimated percentage is greater than 100% when trainees completed more than 1 clinical rotation in palliative care during their residency program.
 ‡Total for available years within the period 2007/08–2016/17.
 §[%] = percentage of family medicine residents for whom data were available/total number of family medicine residents, expressed as a percentage (see Appendix 2, Supplemental Table S2 for details).
 ¶Medical school L provided combined data for the period 2007/08–2016/17.

between 2007/08 and 2016/17, which corresponds to an estimated 57.9% of family medicine residents (range 14.1%–102.2%) (see Appendix 2, Supplemental Figure S1 for details).

Interpretation

Although most Canadian medical schools offered clinical rotations in palliative care, only a minority of trainees at the undergraduate and postgraduate levels completed such a rotation during their training.

The low rate of completion of palliative care rotations is not unique to Canada; it has also been observed in the United Kingdom,^{11,12} the United States,¹³ Switzerland¹⁴ and Thailand.¹⁵ However, this does not justify the status quo. In 2018 in Canada, cancer, heart and pulmonary diseases, cerebrovas-

cular disease, diabetes mellitus, Alzheimer disease and chronic liver disease were among the leading causes of death.¹⁶ All are usually preceded by prolonged and chronic illnesses requiring symptom management and other psychosocial interventions to improve quality of life. Physicians who have no clinical experience with palliative care may lack the necessary skills and training to care for the majority of Canadians who will die from incurable chronic illnesses.

Adequate human and financial resources are lacking for palliative care training programs in most Canadian medical schools, which limits the opportunity for trainees to access palliative care training.¹⁷ Even if palliative care rotations were mandatory for the selected specialty or subspecialty programs in this study, current palliative care training resources would not be sufficient to meet this requirement at most centres.

In a comparative study of palliative care education between the UK and the US, Hammel and colleagues¹⁸ suggested the creation of academic palliative care departments to develop and sustain this field through education and exposure to role models. Palliative care training has been recognized as an essential component of training for physicians for more than 20 years.^{19,20} Studies show that it positively influences students' ability to provide good clinical care²¹ and improves skills in end-of-life discussions.²² Palliative care training is also highly appreciated by medical students worldwide.^{11,23,24}

The new 2-year subspecialty training programs in palliative medicine with corresponding recognition by the Royal College of Physicians and Surgeons of Canada may encourage the development of stronger palliative care programs in all Canadian medical schools. The College of Physicians of Quebec has yet to recognize this subspecialty. In the US, Congress recently passed the *Palliative Care and Hospice Education and Training Act*,²⁵ which will increase the number of permanent faculty in palliative care. We hope this will provide impetus to improve palliative care education and research in Canada.

Limitations

Our study has limitations. We could not obtain data from all medical schools, and the relevant data were not kept by the College of Family Physicians of Canada or the Royal College of Physicians and Surgeons of Canada. The exclusion of these missing data from the analysis likely led to overestimation of the undergraduate and family medicine trainees who completed clinical rotations in palliative care, since the schools and programs with mandatory rotations would have had a greater influence on the overall number. Owing to the manner in which the data were compiled at each medical school, collecting data at the individual trainee level was not feasible, and we could only estimate the proportion of trainees who completed a palliative care rotation. If a trainee completed more than 1 rotation in palliative care, this trainee was counted multiple times in the numerator, which led to overestimation in some cases. Moreover, most medical schools did not record the exact duration of the rotations.

Notably, we also did not collect data on palliative care clinical training that may have occurred during other rotations, as some schools may have integrated some palliative care training within other rotations. During the study period, national palliative care competencies were defined for the undergraduate level but were not implemented in the curricula of all medical schools.

At the postgraduate level, at the time of the study, the majority of training programs did not have palliative care competencies. A description of standardized competencies in palliative care for all postgraduate specialty and subspecialty training programs in disciplines other than palliative medicine was subsequently developed in 2019.²⁶ A set of 12 Entrustable Professional Activities for palliative medicine has also been developed,²⁶ but these were meant to apply only to palliative care training programs, and they were not available during the study period.

Conclusion

Our study shows that, among Canadian medical trainees at the undergraduate and postgraduate levels, completion of palliative care clinical rotations is limited and inconsistent. Basic palliative competencies are essential for the provision of care in family medicine and in many specialties and subspecialties. It is well recognized that, without dedicated clinical exposure to palliative care, many trainees will enter practice without these vital competencies required for optimal care of the growing population of patients with chronic incurable illnesses and at the end of life.

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