

Original Article

Palliative Care Competencies and Readiness for Independent Practice: A Report on the American Academy of Hospice and Palliative Medicine Review of the U.S. Medical Licensing Step Examinations



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Abstract

Context. It is unknown whether the palliative care (PC) content tested in the U.S. Medical Licensing Examination (USMLE) step examinations reflects the consensus-developed PC competencies.

Objectives. To review the USMLE step examinations to determine whether they test the PC knowledge necessary for graduating medical students and residents applying for licensure.

Methods. Eight PC physicians reviewed three complete examination forms and a focused 509-item bundle of multiple-choice questions (MCQs) identified by the USMLE content outline as potentially assessing PC content. Reviewers determined MCQs to be PC items if the patient was seriously ill and PC knowledge was required to answer correctly. PC items' competency domains were determined using reference domains from PC subspecialty consensus competencies.

Results. Reviewers analyzed 1090 MCQs and identified 242 (22%) as PC items. PC items were identified in each step examination. Patients in PC items were mostly males (62.8%), older than 65 years (62%), and diagnosed with cancer (43.6%). Only 6.6% and 6.2%, respectively, had end-stage heart disease or multimorbid illness. Fifty-one percent of PC items addressed ethics (31%) or communication (19.8%), focusing on patient autonomy, surrogate decision makers, or conflict between decision makers. Pain and symptom management was assessed in 28.5% of PC items, and one-third of those addressed addiction or substance use disorder.

Conclusion. We identified PC content in each step examination. However, heart disease and multimorbidity were under-represented in PC items relative to their prevalence. In addition, there was heavy overlap with ethics, a focus on conflict in assessing communication skills, and emphasis on addiction when testing pain management. Our findings highlight opportunities to enhance testing of clinical PC skills essential for all licensed physicians practicing medicine. *J Pain Symptom Manage* 2018;56:371–378. © 2018 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

Key Words

Education, students, medical, internship and residency, licensure

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Introduction

There is an increasing recognition of the benefits of palliative care (PC) when caring for seriously ill patients.^{1–5} All physicians are expected to have basic PC skills and knowledge as a part of providing competent care to patients.^{3,4,6} This is particularly important as the number of PC subspecialists in the U.S. is insufficient to care for the aging population.⁷ Basic PC competencies include domains such as providing optimal pain and symptom management; aiding in medical decision making concordant with patient values; and improving quality of life throughout the course of an advanced illness.^{1–3}

The initial knowledge necessary to provide such care is introduced in medical school and further honed in residency and fellowship training. Increasingly, PC content is being integrated into medical student and resident curricula.^{8–12} In 2014, Schaefer et al.⁶ published specialty-based consensus competencies for PC that identified clinical skills essential for graduating medical students and residents in preparation to practice at the level of a physician-in-training. One way to determine whether physicians-in-training have the necessary knowledge to perform these competencies would be through their performance on summative examinations for licensure, such as the U.S. Medical Licensing Examination (USMLE). The USMLE is co-owned and administered by the National Board of Medical Examiners (NBME), the Federation of State Medical Boards, and the Educational Commission for Foreign Medical Graduates.

Currently, the only information about the PC content of USMLE is the publicly available content outline from USMLE, which includes a subheading of *death and dying and palliative care*.¹³ It is not known whether the domains currently tested in USMLE step examinations map to the consensus-developed PC competencies. The purpose of this study was to review the computer-based USMLE step examinations to determine whether they test clinical PC knowledge necessary for graduating medical students and residents applying for licensure. We additionally intended to identify critical gaps in the examinations' PC content.

Methods

This study was determined to be exempt by the Mayo Clinic Institutional Review Board.

The Reviewers

Eight hospice and palliative medicine subspecialists from across the U.S. assembled to review the USMLE step examinations, on June 15 and 16, 2016, at the

NBME headquarters in Philadelphia, Pennsylvania. Reviewers were accompanied and aided by the Director of Education and Learning from the American Academy of Hospice and Palliative Medicine (AAHPM) (J. B.) and staff from NBME (M. P.). AAHPM leadership selected reviewers based on their current and prior national work in PC education. Before arrival, reviewers constructed a plan for the review grounded in the published PC competencies for graduating medical students and residents applying for licensure.⁶

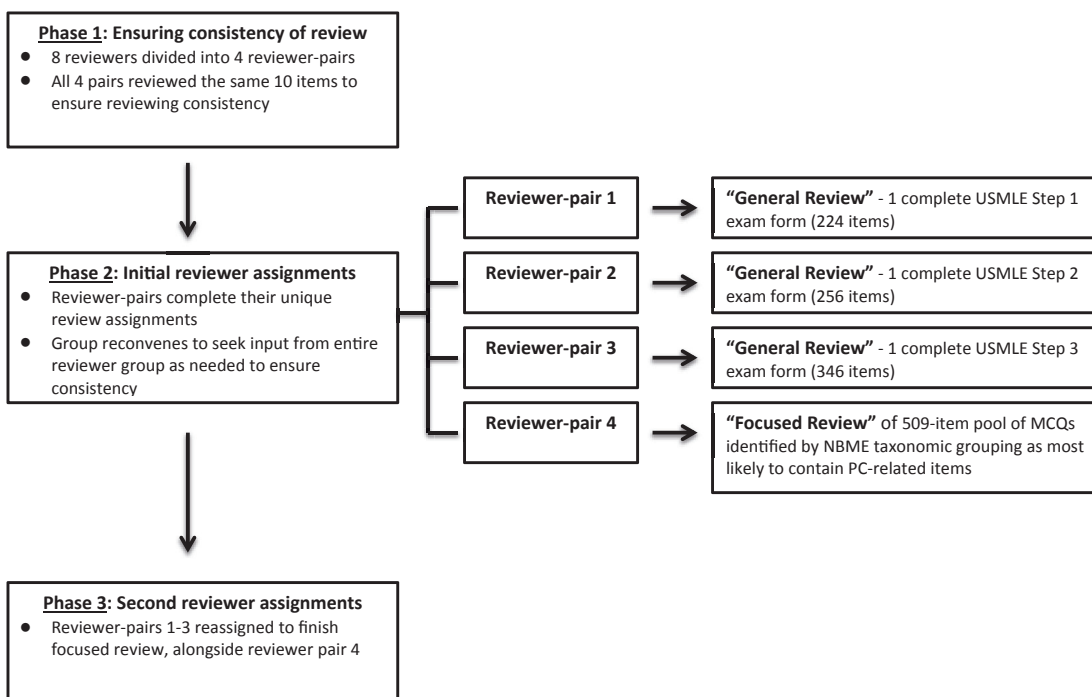
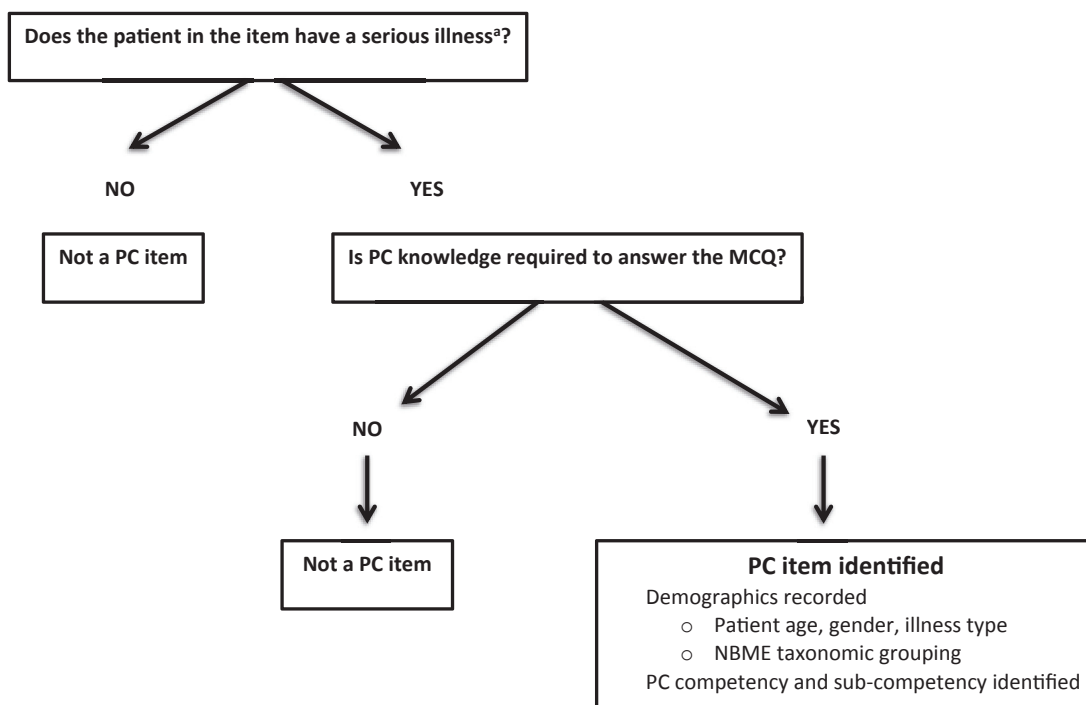
Review Process

Most of the two-day review period was spent evaluating multiple-choice questions (MCQs) from USMLE Step 1, Step 2 clinical knowledge (CK), and Step 3 examinations (Fig. 1). Reviews were conducted in pairs. The reviewer pairs were able to confer with the entire reviewer group as needed with clarifying questions or to reach consensus.

To promote consistency, all reviewer pairs simultaneously evaluated the first 10 eligible items from the same examination and subsequently discussed them as a group to reach consensus on item characteristics. Once reviewing consistency was verified, each pair performed an independent review of the MCQs assigned to that pair. Reviewer pairs worked collaboratively and in a stepwise fashion to review each MCQ. First, each individual reviewer assessed the characteristics of the MCQ independently. Subsequently, the reviewer pairs discussed their findings to reach consensus. Finally, if the pair had questions or could not reach consensus, they asked the entire PC reviewer group for input.

To ensure a broad sampling of PC content, the review took a two-pronged approach (Fig. 1a). First, three reviewer pairs were assigned to do a general review in which each pair reviewed one complete examination from each of the computer-based USMLE Steps 1, 2 CK, and 3. This general review gave a picture of what content an individual student might encounter when taking a single step examination. All MCQs from the three examinations were reviewed.

Second, the fourth reviewer pair was assigned to initiate a focused review of a 509-item bundle of MCQs pulled from a 10-year sampling of USMLE. NBME staff ensured that there was no overlap between questions in the general and focused reviews. For the focused review, NBME staff identified MCQs that were likely to contain PC content using the USMLE content outline, which maintains that PC items generally fall within the taxonomic grouping, *social sciences* under the subheading *medical ethics/jurisprudence* and the second level subheading of *death/dying/PC*.¹³ The focused review gave reviewers a picture of the

a Reviewer workflow**b Palliative Care (PC) Item Analysis**

^a Defined as an illness having a high risk of death or ICU admission within 5 years.

Fig. 1. Overview of review process. (a) Reviewer workflow. (b) PC item analysis. USMLE = U.S. Medical Licensing Examination; MCQs = multiple-choice questions; NBME = National Board of Medical Examiners; PC = palliative care.

population of potential PC items presented in the examinations overall, thus allowing us to determine the domains covered by PC items on step examinations generally. The reviewers assessed 52% ($n = 264$) of the 509 eligible MCQs in the focused bundle. The initial 35% of MCQs were reviewed for more than seven hours in the order in which they were presented, at which point it became clear that reviewers did not have sufficient time to assess all 509 MCQs in the bundle. Reviewers then engaged a random number generator to select the remaining MCQs to review, ensuring that they assessed more than 50% of the focused bundle.

PC Item Analysis

Our first task was to identify MCQs that assessed PC content in patients with serious illness and their families (Fig. 1b). PC items were required to meet two criteria: First, the patient in the MCQ had a serious or life-limiting illness, which reviewers defined as including patients at high risk of death or intensive care unit admission within five years.¹⁴ Subsequently, reviewers evaluated whether PC knowledge was required to answer the MCQ correctly, using the PC competencies for graduating medical students and residents applying for licensure⁶ as a guide for determining what specific PC knowledge the MCQ assessed. Items that addressed ethics content generally, without explicit PC content as part of the testing point, were excluded, whereas items that addressed both ethics and PC content were included.

PC items were further classified based on patient demographics (pediatric, adult, and geriatric), disease category, and the NBME-specified taxonomic grouping.¹³ Disease categories were defined by the authors before initiating the review and reflect commonly seen serious and life-limiting illnesses in the U.S. The taxonomy for categorizing items used by NBME is based on organ system and physician task, and they are used to distribute content across examination forms.¹³

Data Management and Analysis

Data were summarized using descriptive statistics. Discrete variables were described using total numbers and percentages, and continuous variables (e.g., age) were described using mean, median, and range. Analyses were conducted using Microsoft Excel software (version 14.7.1; Microsoft Corporation, Redmond, WA; copyright 2010).

Results

Reviewers

There were eight physician reviewers, with an average of 16.6 years (SD 5.5) practicing and 16.9 years

Table 1
Characteristics of Reviewers ($N = 8$)

Characteristic	Measure— n (%)
Female	3 (37.5)
Academic rank	
Assistant professor	3 (37.5)
Associate professor	3 (37.5)
Professor	2 (25)
Years in practice, mean (SD)	16.6 (5.5)
Primary board specialty	
Internal medicine	6 (75)
Family medicine	1 (12.5)
Pediatrics	1 (12.5)
Board certified in PC	8 (100)
Additional board certification	
Geriatrics	4 (50)
Hospice medical director certification	2 (25)

PC = palliative care.

(SD 5.1) teaching PC. All reviewers have taught all levels of physician learners, from medical students through practicing physicians. Academic ranks of reviewers included assistant professor (37.5%), associate professor (37.5%), and professor (25%). All reviewers are board certified in hospice and palliative medicine, with primary boards, including internal medicine (75%), family medicine (12.5%), and pediatrics (12.5%) (Table 1).

PC Items

Reviewers analyzed a total of 1090 MCQs in the general and focused reviews combined and identified 242 (22%) as PC items. In the focused review of the 509-pooled items identified through the content outline as most likely to contain PC content, we determined 217 of the 264 items reviewed (82.2%) to be PC items. In the general review, we identified that PC items made up 4% (9 of 224), 2% (5 of 256), and 3.2% (11 of 346) of Steps 1, 2 CK, and 3 examinations, respectively (Table 2).

Table 3 describes the demographic characteristics of the patients in all 242 PC items identified. Most test patients in PC item vignettes were males (62.8%) and at least 65 years old (62%). Pediatrics represented 4% of the patients in PC items overall. There was one pediatric PC item in each of the three complete step examinations reviewed.

When we looked at the categorization of PC items according to taxonomic grouping from the USMLE outline,¹³ we found that 93% of PC items were categorized under *social sciences*. When we looked at reviewer categorizations of disease categories, a plurality of PC test patients presented with hematologic/oncologic illness (46.3%), and another 17.4% had neurodegenerative disease (e.g., dementia) or stroke. Only 6.6% of PC test patients had end-stage heart disease or vascular disease, and 6.2% presented with multimorbid illness (Table 3).

Table 2
PC Items Identified in Both the Focused and General Reviews

	Focused Review	General Review		
	Pooled Items (N = 509)	Step 1 (N = 224)	Step 2 (N = 256)	Step 3 (N = 346)
Multiple Choice Items		n (%)	n (%)	n (%)
Number (%) of items reviewed	264 (51.9)	224 (100)	256 (100)	346 (100)
Patients in reviewed items had serious illness	248 (93.9)	50 (22.3)	26 (10.2)	62 (17.9)
PC items	217 (82.2)	9 (4.0)	5 (2.0)	11 (3.2)

PC = palliative care.

Table 4 describes which PC competencies and subcompetencies for graduating medical students and residents applying for licensure⁶ were tested. All five core competencies were assessed to some degree, as were all but three of the subcompetencies. Fifty-one percent of PC items addressed ethics (31%) or the competency of communication (19.8%). However, per reviewer notes, those items focused on patient

autonomy, surrogate decision makers, or conflict between decision makers. About 69 (28.5%) of the PC items reviewed assessed the competency of pain and symptom management, whereas one-third (23 of 69) of those items assessed knowledge pertaining to addiction or substance use disorders. Although 36.8% of PC items assessed the competency of terminal care and bereavement, most of those addressed ethical issues as an essential component of the testing point (Table 4).

Subcompetencies that were assessed in 2% or fewer of the PC items included diagnosing anxiety, depression, and delirium (2.1%); handling emotions in patients and families facing serious illness (0.4%); identifying spiritual and existential suffering in patients/families (0.8%); identifying patient/family cultural values and beliefs (1.2%); and describing normal grief and risk factors for prolonged grief disorder (2.1%). Three subcompetencies were not assessed at all: declaring patient death; describing the role of interdisciplinary team members; and reflecting on personal emotional reactions to patients' deaths (Table 4).

Discussion

We sought to evaluate the extent to which the knowledge-based USMLE (Steps 1, 2 CK, and 3) assessed the PC knowledge necessary for graduating medical students and residents applying for licensure. We found that each of the three complete step examination forms we reviewed contained PC content that aligned with the PC specialty-based consensus competencies.⁶ In addition, the PC items reviewed covered all the core competencies to some degree and all but three of the subcompetencies.⁶ However, some competencies were tested repeatedly, whereas others were undertested, including the role of interdisciplinary team members, best practices in pain management, and communication skills such as responding to emotions and identifying patient/family cultural values.

The USMLE could better assess core PC content by making six changes. First, the disease-specific

Table 3

Patient Demographics, NBME-Defined Taxonomic Groupings, and Reviewer-Identified Disease Categories (N = 242) in all PC Items Identified in the Review

Age/Population of Patients in Items Assessing PC Content	N = 242
Patient gender—female, n (%)	90 (37.2)
Patient age	
Adult (ages 18–64), n (%)	82 (34)
Ages (range)	20–64
Median	52
Geriatric (older than 65 yrs), n (%)	150 (62)
Ages (range)	65–99
Median	78
Pediatric (younger than 18 yrs), ^a n (%)	10 (4)
Ages (range)	<1–17
Median	9.5
Taxonomic groupings, defined by NBME ^b	n (%)
Biostatistics and epidemiology	1 (0.4)
Cardiology	2 (0.8)
Gastrointestinal	3 (1.2)
Multisystem	1 (0.4)
Neurology	4 (1.7)
Psychiatry	4 (1.7)
Respiratory	2 (0.8)
Social sciences	225 (93)
Disease categories ^c	
End-stage heart disease (including congestive heart failure) or peripheral arterial disease	16 (6.6)
End-stage liver or kidney disease	8 (3.3)
End-stage lung disease	10 (4.1)
Hematology/oncology	112 (46.3)
Neurodegenerative disease or stroke	42 (17.4)
Other disease (includes HIV)	39 (16.1)
More than one disease	15 (6.2)

NBME = National Board of Medical Examiners; PC = palliative care.

^aPediatric PC items were present in each of the three complete step examination forms reviewed.

^bTaxonomic groupings are defined by NBME, who categorizes examination content across 17 organ systems, including biostatistics and epidemiology, cardiology, dermatology, endocrine, female reproductive, gastrointestinal, general principles, hematology, male reproductive, multisystem, musculoskeletal, neurology, pregnancy, psychiatry, renal, respiratory, and social sciences. Organ systems in which we found PC content are included in the table.

^cDisease categories listed previously were defined by the authors before initiating review to reflect commonly seen serious and life-limiting illnesses and determined by reviewers evaluating each item.

Table 4
Competencies and Subcompetencies Addressed Within PC Items (N = 242)

Competencies and Subcompetencies	n (%)
By Competency	
Pain and symptom management	69 (28.5)
Communication	48 (19.8)
Psychosocial, spiritual, and cultural aspects of care	15 (6.2)
Terminal care and bereavement	89 (36.8)
PC principles and practice	21 (8.7)
By subcompetency	
<i>Pain and symptom management</i>	
Assesses pain systematically and distinguishes nociceptive from neuropathic pain syndromes	16 (6.6)
Describes key issues and principles of pain management with opioids, including equianalgesic dosing, common side effects, addiction, tolerance, and dependence ^b	23 (9.5)
Assesses nonpain symptoms and outlines a differential diagnosis, initial workup, and treatment plan	24 (9.9)
Describes an approach to the diagnosis of anxiety, depression, and delirium	5 (2.1)
Pain and symptom other ^a	1 (0.4)
<i>Communication</i>	
Explores patient and family understanding of illness, concerns, goals, and values that inform the plan of care	28 (11.6)
Demonstrates patient-centered communication techniques when giving bad news and discussing resuscitation preferences	16 (6.6)
Demonstrates basic approaches to handling emotion in patients and families facing serious illness	1 (0.4)
Communication other ^a	3 (1.2)
<i>Psychosocial, spiritual, and cultural aspects of care</i>	
Identifies psychosocial distress in patients and families	8 (3.3)
Identifies spiritual and existential suffering in patients and families	2 (0.8)
Identifies patients' and families' cultural values, beliefs, and practices related to serious illness and end-of-life care	3 (1.2)
Psychosocial other ^a	2 (0.8)
<i>Terminal care and bereavement</i>	
Identifies common signs of the dying process and describes treatments for common symptoms at the end of life	7 (2.9)
Describes the communication tasks of a physician when a patient dies, such as pronouncement, family notification and support, and request for autopsy	0
Describes normal grief and bereavement and risk factors for prolonged grief disorder	5 (2.1)
Describes ethical principles and inform decision making in serious illness, including the right to forgo or withdraw life-sustaining treatment and the rationale for obtaining a surrogate decision maker	75 (31.0)
Terminal other ^a	2 (0.8)
<i>PC principles and practice</i>	
Defines the philosophy and role of PC across the life cycle and differentiates hospice from PC	7 (2.9)
Describes disease trajectories for common serious illnesses in adult and pediatric patients	13 (5.4)
Describes the roles of members of an interdisciplinary PC team, including nurses, social workers, case managers, chaplains, and pharmacists	0
Reflects on personal emotional reactions to patients' dying and deaths	0
Palliative other ^a	1 (0.4)

PC = palliative care.

^aThe other category within each competency includes items that fit clearly into the overarching competency but did not clearly fit any of the subcompetencies listed.

^bThis includes the subcompetency added by the investigators, "Assess opioid benefit/harm balance, addiction, and substance use disorder."

demographics of the patients in PC items could more accurately reflect seriously ill patients. For example, heart disease is the leading cause of death in the U.S.,^{15,16} and it was under-represented in test items. In contrast, other diseases, like advanced cancer, dementia, and stroke, were over-represented. Second, most chronic life-limiting diseases are characterized by a prolonged course with unexpected episodes of disease progression.¹⁷ To better align testing of PC concepts and the natural history of these diseases, PC items could be embedded into unfolding case vignettes, thus allowing for more than one assessment point throughout disease progression. Third, most seriously ill patients suffer from multiple diseases,¹⁸ and clinical competence necessitates being able to understand the interactions between the different illnesses. Test items should include more multiply morbid patients and assess concepts that demonstrate

understanding of how a test or prescription for one illness affects another illness.

Fourth, more items are needed that pertain to nonpain symptoms, particularly in seriously ill patients with noncancer diagnoses. Heart disease, chronic lung disease, renal disease, stroke, and dementia are among the most common causes of death in the U.S.,¹⁵ and patients with those illnesses suffer a high symptom burden^{19–22}—symptoms that often need to be managed over years in the setting of ongoing disease progression and decline.¹⁷

Fifth, there was a significant focus on addiction in questions on pain management. Although we recognize the importance of substance use disorders and addiction, particularly with the high mortality rate associated with prescription opioids,^{23,24} assessing best practices in pain and symptom management and prescribing are equally important for safe patient care.

Indeed, a workforce that is skilled in safely managing pain and prescription of controlled substances is less likely to errantly prescribe or provide insufficient oversight and follow-up.

Finally, PC items focused heavily on ethics and patient-family-physician communication, with an emphasis on navigating conflict and ethical scenarios. PC items pertaining to communication focused on errors and challenges instead of addressing best practices in communication or strategies for building effective relationships with patients. Indeed, fewer than 2% of the items we reviewed assessed the basic skills of responding to emotion or exploring cultural values and beliefs. Understanding patients' worldview and values is an essential step for clinicians who wish to help patients understand their illness and construct a care plan aligned with their values. We recognize, however, how challenging it is to write MCQs that effectively assess communication competencies. This presents us with exciting opportunities to test critical communication domains in the clinical skills portion of Step 2 examination or with other innovative assessment formats in future.

This study has limitations. First, we were not able to review all the questions made available to us in the allotted time. Second, our definition of PC is broader than that of NBME, based both on the USMLE content outline¹³ and the findings of our review. It is likely, therefore, that there are questions within other taxonomic groupings that reviewers might have identified as PC items had they reviewed them. For example, there may be more questions assessing anxiety, depression, and delirium in seriously ill patients than the 2% of PC items we identified, but they might be categorized within neurology, psychiatry, or general principles. In addition, we were not able to compare the extent to which our assessment of PC items agreed with that of NBME, because the specific percentage of questions within any category is proprietary information.²⁵ Finally, we made a deliberate decision to focus our recommendations on enhancing the quality of PC content across the step examinations instead of the quantity, both because the optimal amount of content is unknown (e.g., to generate a reportable subscore domain for a given examination) and because multiple specialty and stakeholder societies have advocated for their own interests being represented in the examination series over the years,^{26,27} yet the USMLE is structurally limited in how much of any content area can be delivered during an examination period. We hope that our recommendations will allow for integration of PC concepts across a breadth of organ systems and patient populations in a manner that improves the examinations themselves and ultimately medical student and resident PC knowledge and skills.

Our findings highlight opportunities to enhance USMLE content to better reflect the need for all licensed physicians to have basic skills in PC that will prepare them to care for the ever-growing population of complex seriously ill patients. Moreover, our findings and recommendations align with input from public stakeholders to NBME, which identified end-of-life care and patient-provider communication as the second and third most important health issues facing the public, respectively.²⁸ Future work should focus on strategies for effectively threading competency-based PC content throughout medical student and resident education and assessment to prepare our workforce to optimally care for seriously ill patients across the continuum of care.

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