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# The National Postdoctoral Palliative Care Research Training Collaborative: History, Activities, Challenges, and Future Goals

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## Abstract

**Background:** Palliative care-related postdoctoral training opportunities are critical to increase the quantity and quality of palliative care research.

**Objective:** To describe the history, activities, challenges, and future goals of the National Postdoctoral Palliative Care Research Training Collaborative.

**Design:** National web-based survey of participating program leaders.

**Measurements:** Information about participating programs, trainees, challenges faced, and future goals.

**Results:** Nine participating programs at academic institutions across the United States focus on diverse aspects of palliative care research. The majority of 73 current and former fellows are female (75%) and white (84%). In total, 38% of fellows ( $n=28$ ) have MD backgrounds, of whom less than half ( $n=12$ ) completed hospice and palliative medicine fellowships. An additional 38% of fellows ( $n=28$ ) have nursing PhD backgrounds and 23% ( $n=17$ ) have other diverse types of PhD backgrounds. Key challenges relate to recruiting diverse trainees, fostering a shared identity, effectively advocating for trainees, and securing funding. Future goals include expanding efforts to engage clinician and nonclinician scientists, fostering the pipeline of palliative care researchers through expanded mentorship of predoctoral and clinical trainees, increasing the number of postdoctoral palliative care training programs, and expanding funding support for career development grants.

**Conclusion:** The National Postdoctoral Palliative Care Research Training Collaborative fills an important role in creating a community for palliative care research trainees and developing strategies to address shared challenges.

**Keywords:** education; health services research; palliative care; support of research; training support

## Introduction

IMPROVING THE QUALITY OF CARE for persons experiencing serious illness remains one of the greatest challenges facing our health care delivery system. The past two decades have seen tremendous growth in clinical palliative care ser-

vices: as of 2019, 72% of 50+ bed hospitals report having a palliative care program, an increase from 7% in 2001.<sup>1</sup> This rapidly changing health care landscape requires rigorous research to inform optimal design and delivery of serious illness care. Evidence indicates that more palliative care research grants are being funded, but the number of studies

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supported by National Institutes of Health (NIH) dollars (<1% of all NIH research studies, with no notable increases in the past 10 years<sup>2</sup>) remains woefully inadequate to fill well-described evidence gaps and drive the field forward. The Palliative Care and Hospice Education and Training Act (PCHETA) includes language to expand palliative care research programs under the NIH. This bill was passed in the U.S. House of Representatives in October 2019, but has not yet been brought to a vote in the Senate.<sup>3</sup>

Postdoctoral training opportunities are a critical component of efforts to increase the quantity and quality of palliative care research. The field needs highly trained interdisciplinary investigators, representing multiple clinical specialties and various PhD-prepared disciplines. Clinical fellows typically require additional research training, experience, and mentorship to be competitive for faculty positions as clinician investigators. PhD-trained scientists also benefit from postdoctoral positions as a bridge to academic research careers. For PhDs who trained in nonclinical environments, postdoctoral fellowships often offer valuable exposure to the clinical milieu. Recognizing shared opportunities and challenges in this sphere, the National Postdoctoral Palliative Care Research Training Collaborative was formed to support programs working toward the shared goal of training the next generation of palliative care researchers.

This article reports on the history and activities of the National Postdoctoral Palliative Care Research Training Collaborative. It includes details of participating postdoctoral training programs as well as a description of fellows trained to date. It describes challenges facing the field related to recruitment, fostering a shared identity, and funding. Finally, it outlines five recommendations to increase the palliative care research workforce alongside the clinical enterprise and ensure maximal innovation and impact.

## Methods

### **Overview of the National Postdoctoral Palliative Care Research Training Collaborative**

The collaborative was founded in 2016 with the goal of creating synergies among postdoctoral training programs targeting palliative care research. In 2017, a group of leaders from palliative care research programs across the United States convened for a one-day planning meeting sponsored by the National Palliative Care Research Center.<sup>4</sup> The meeting agenda focused on opportunities to create collaboration among training programs and foster a national community of research trainees.

Program leaders discussed three main priorities at this inaugural meeting: (1) the importance of sharing research training materials and expertise to strengthen the field and avoid reinventing the wheel; (2) creating new opportunities for mentorship, peer support, and collaboration among trainees across the country; and (3) leveraging the geographic and programmatic variation among programs to ensure successful recruitment of diverse applicants.

Program leaders have continued to hold monthly conference calls and work on these shared priorities, with additional programs joining over time. Activities to date include (1) creating a community of scholars for palliative care research trainees at participating institutions; (2) hosting career development webinars on high-priority topics identified by

trainees, now housed on the National Palliative Care Research Center website (<http://www.npcrc.org/content/62/National-Post-Doctoral-Palliative-Care-Research-Training-Collaborative.aspx>) (Table 1); and (3) hosting an annual in-person gathering for trainees and program leaders at the Annual Assembly of Hospice and Palliative Care, presented by the American Academy of Hospice and Palliative Medicine (AAHPM) and the Hospice and Palliative Nurses Association (HPNA). The collaborative has also created a joint recruitment flyer for wide distribution, advertising the unique strengths of participating programs and those available on the AAHPM website (<http://aahpm.org/education/research>).

### **Participating postdoctoral palliative care research training opportunities**

A web-based survey distributed to program leaders in February 2020 solicited details about participating programs and trainees. The University of Pittsburgh IRB deemed the survey (used to gather information for this article) to be exempt. Nine programs participated in the National Postdoctoral Palliative Care Research Training Collaborative at the time of survey administration (Table 2). A tenth program, representing a collaboration between palliative care, geriatrics, and general internal medicine at the Icahn School of Medicine at Mount Sinai, began on July 1, 2020.

## Results

Participating programs represent postdoctoral training opportunities at academic institutions across the United States. While palliative care research is not disease specific, the program scope is determined by local expertise and funding agencies. For example, the Cambia Palliative Care Center of Excellence Palliative Care Research Fellowship Program at the University of Washington, funded in part by the National Heart, Lung, and Blood Institute, focuses on palliative care research related to heart, lung, and blood diseases,<sup>5</sup> while the Cancer Prevention and Control Training Program at the University of Alabama, funded by the National Cancer Institute, focuses on palliative care research in oncology. Of note, program leaders represent diverse disciplines, the majority have MD backgrounds (67%), and most trained before the field of palliative care was well established in the United States. While gender parity is in evidence among the leadership (67% female), racial and ethnic diversity remains unrealized (86% Caucasian) (Table 3).

Funding sources include multiple NIH institutes and centers as well as the Department of Veterans Affairs. Many programs are supported by the Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Research Training Grant (T32), an NIH funding mechanism designed to enable institutions to recruit individuals selected by program leadership for predoctoral and/or postdoctoral research training in specified scientific areas.<sup>6</sup> Five programs explicitly stated that they receive local institutional support. The oldest participating fellowship program was established at University of California, San Francisco, in 1991, with an initial focus on geriatrics that naturally evolved to include emphasis on palliative care. The postdoctoral fellowship program at the University of Pittsburgh was established in 2006, but did not include trainees focused on palliative care research until more recently. All other programs were

TABLE 1. SAMPLE NATIONAL POSTDOCTORAL PALLIATIVE CARE RESEARCH TRAINING COLLABORATIVE CAREER DEVELOPMENT WEBINARS

| <i>Webinar topic</i>   | <i>Facilitators</i>  | <i>Brief description</i>   | <i>Date</i>       |
|--|--|--|-------------------|
| Supporting Palliative Care Research Fellows Through the Pandemic | Katherine Bernier Carney, PhD, RN, Postdoctoral Fellow, College of Nursing, University of Utah   | This webinar discusses challenges faced by postdoctoral fellows during the COVID-19 pandemic, including potential changes to the job market, maintaining productivity while working from home, and networking while socially distancing.                               | June 3, 2020      |
| Managing Up  | Jean S. Kutner, MD, MSPH, Professor of Medicine, Chief Medical Officer at the University of Colorado<br>Christine S. Ritchie, MD, MSPH, Kenneth L. Minaker Chair in Geriatrics and Director of Research, Division of Palliative Care and Geriatric Medicine, Massachusetts General Hospital      | This webinar discusses how to develop effective relationships with those to whom we report and/or who have some kind of authority/meaningful influence over us. Includes case studies and an opportunity to create an action plan.                                     | December 18, 2019 |
| Beyond Your Four Walls: Mentoring Relationships in Digital Era   | Lee Ellington, PhD, Professor and Robert S. and Beth M. Carter Endowed Chair at the University of Utah College of Nursing<br>Amy R. Newman, PhD, RN, Assistant Professor at Marquette University College of Nursing; Former T32 Postdoctoral Fellow at the University of Utah College of Nursing | Robust mentoring relationships can be built and sustained from a distance. This webinar outlines strategies for identifying and developing a mentoring relationship with a mentor who is geographically separate from you and how to make the relationship successful. | November 11, 2019 |
| Writing a Career Development Award                               | J. Randall Curtis, MD, MPH, Professor, Director of Cambia Palliative Care Center of Excellence at University of Washington<br>Erin K. Kross, MD, Associate Professor, Division of Pulmonary, Critical Care and Sleep Medicine, University of Washington  | This webinar outlines different types of mentored awards and provides information on timelines, deadlines, planning, and key components of career development awards, with discussion of strategies for writing a successful grant.                                    | February 11, 2019 |
| Ask the Experts: Dr. Randall Curtis and Dr. Karin Steinhauser    | Randall Curtis, MD, MPH, Professor, Director of Cambia Palliative Care Center of Excellence at University of Washington<br>Karen Steinhauser, PhD, Professor, Departments of Population Health Sciences and Medicine, Duke University  | Interactive webinar responding to participant questions about opportunities in palliative care research, strategies for grant writing, work-life balance, how to say no, dealing with rejection, and other topics of interest.   | November 14, 2018 |
| 12 Books You Should Read to Have an Academic Career              | Robert Arnold, MD, FAAHPM, Distinguished Service Professor of Medicine, Chief Medical Officer for the UPMC Palliative and Supportive Care Institute, University of Pittsburgh  | Dr. Arnold discusses devoting time to personal growth and shares 12 nonmedical books you should read to become a better faculty person.  | August 29, 2018   |
| Applying for Research Jobs in Palliative Care                    | Yael Schenker, MD, MAS, FAAHPM, Associate Professor of Medicine and Director, Palliative Research Center (PaRC), University of Pittsburgh  | This webinar provides a step-by-step guide to applying for a first research job.   | May 25, 2018      |

All available at <http://npccr.org/content/62/National-Post-Doctoral-Palliative-Care-Research-Training-Collaborative.aspx>

established within the last 10 years, reflecting the recent growth of palliative care research as a relatively new field of postdoctoral study.

#### **Postdoctoral fellows trained to date**

Thirty fellows are currently enrolled in participating programs (range 1–6 fellows per program) and 43 fellows have graduated. The majority of fellows are female (75%) and white (84%). Thirty eight percent of current and former fel-

lows ( $n=28$ ) are physicians, with residency training in internal medicine ( $n=20$ ), family medicine ( $n=1$ ), pediatrics ( $n=5$ ), and medicine-pediatrics ( $n=1$ ) and an international medical graduate ( $n=1$ ). A minority ( $n=12$ ) completed hospice and palliative medicine fellowships. One in five current and former fellows ( $n=15$ ) completed other types of clinical fellowships, including adult hematology/oncology ( $n=6$ ), pediatric hematology/oncology ( $n=2$ ), pulmonary critical care ( $n=4$ ), cardiology ( $n=2$ ), and nephrology ( $n=1$ ). An additional 38% ( $n=28$ ) of fellows have nursing

TABLE 2. POSTDOCTORAL PALLIATIVE CARE RESEARCH TRAINING PROGRAMS PARTICIPATING IN THE COLLABORATIVE

| <i>Institution</i>  | <i>Location</i>   | <i>Fellowship name(s)</i>   | <i>Primary funder</i>        | <i>Brief description</i>  | <i>Website</i>   |
|---|-------------------|---|------------------------------|---|--|
| Dana-Farber Cancer Institute/Harvard Medical School                   | Boston, MA        | Dana-Farber Cancer Institute Research Fellowship in Psychosocial Oncology and Palliative Care                       | Dana-Farber Cancer Institute | Program directed toward physicians, psychologists, PhD-prepared nurses, social workers, and other clinicians to prepare them for an academic research career in palliative care or psychosocial oncology  | <a href="https://www.dana-farber.org/for-physicians/education-and-training/fellowships-and-training-programs/psychosocial-oncology-and-palliative-care-research-fellowship/">https://www.dana-farber.org/for-physicians/education-and-training/fellowships-and-training-programs/psychosocial-oncology-and-palliative-care-research-fellowship/</a>  |
| Duke University   | Durham, NC        | Duke training in palliative care research   | VA/Other                     | Training offered through a combination of existing T32 and VA postdoctoral fellowships offers opportunities for researchers with interests in aging, oncology, and health services research, with an emphasis on population-based approaches to palliative care | <a href="https://sites.duke.edu/centerforaging/education-and-training/research-training-in-aging-and-human-development/the-postdoctoral-research-training-program-in-aging/">https://sites.duke.edu/centerforaging/education-and-training/research-training-in-aging-and-human-development/the-postdoctoral-research-training-program-in-aging/</a><br><a href="https://www.durham.hsrd.research.va.gov/Fellowship_HSR.asp">https://www.durham.hsrd.research.va.gov/Fellowship_HSR.asp</a> |
| Icahn School of Medicine at Mount Sinai <sup>a</sup>                  | New York, NY      | Research training on people with Alzheimer's disease-related dementia and other older, vulnerable adult populations | NIH/NIA                      | Two-year postdoctoral T32 research training program focused on multidisciplinary approaches to research at the intersection of geriatric medicine and vulnerable populations  | In development   |
| University of Alabama at Birmingham (UAB)                             | Birmingham, AL    | T32 Cancer Prevention and Control Training Program  | NIH/NCI                      | Fellowship training individuals committed to becoming independent investigators in cancer prevention; early detection of cancer; and cancer outcomes, survivorship, and palliative care   | <a href="https://www.uab.edu/cpctp/">https://www.uab.edu/cpctp/</a>  |
| University of California, San Francisco (UCSF) Division of Geriatrics | San Francisco, CA | T32 Aging Research Fellowship and VA National Quality Scholars Program  | NIH/NIA<br>VA                | Mentored research and formal, didactic training programs focused on clinical epidemiology and health services research  | <a href="https://geriatrics.ucsf.edu/education/fellows/t32-aging-research-fellowship">https://geriatrics.ucsf.edu/education/fellows/t32-aging-research-fellowship</a><br><a href="https://geriatrics.ucsf.edu/education/fellows/va-national-quality-scholars-program">https://geriatrics.ucsf.edu/education/fellows/va-national-quality-scholars-program</a>   |
| University of Colorado  | Aurora, CO        | University of Colorado Palliative Care and Aging Postdoctoral Research Training                                     | NIH/NIA                      | Two-year fellowship program to prepare postdoctoral fellows for careers as researchers at the intersection of aging and palliative care   | <a href="https://medschool.cuanschutz.edu/general-internal-medicine/education/palliative-care-and-aging-research-training-(t32)">https://medschool.cuanschutz.edu/general-internal-medicine/education/palliative-care-and-aging-research-training-(t32)</a>  |
| University of Pittsburgh  | Pittsburgh, PA    | Pre- and postdoctoral research fellowships in palliative care research (TL1)  | NIH/NCATS                    | Pre- and postdoctoral fellowships, including rigorous research training and interdisciplinary mentorship  | <a href="https://www.icre.pitt.edu/TL1/index.html">https://www.icre.pitt.edu/TL1/index.html</a>  |

(continued)

TABLE 2. (CONTINUED)

| <i>Institution</i>       | <i>Location</i>    | <i>Fellowship name(s)</i>  | <i>Primary funder</i> | <i>Brief description</i>  | <i>Website</i>  |
|--------------------------|--------------------|--|-----------------------|---|---|
| University of Utah       | Salt Lake City, UT | T32 Pre- and postdoctoral fellowships in cancer, caregiving, and end-of-life care  | NIH/NINR              | Pre- and postdoctoral fellowship program in preparation for a research career in cancer, family caregiving, or palliative care  | <a href="https://nursing.utah.edu/research/post-doctoral-fellow/">https://nursing.utah.edu/research/post-doctoral-fellow/</a>   |
| University of Washington | Seattle, WA        | Palliative Care Research Fellowship (T32) at the Cambia Palliative Care Center of Excellence at University of Washington | NIH/NHLBI             | One- to three-year fellowship program in palliative care research related to heart, lung, or blood disease. May include a Master's Degree in Epidemiology or Health Services Research | <a href="https://depts.washington.edu/pallcntr/pallcareresearchfellowship.html">https://depts.washington.edu/pallcntr/pallcareresearchfellowship.html</a>   |
| University of Washington | Seattle, WA        | Postdoctoral Fellowship in Omics and Symptom Science   | NIH/NINR              | Pre- and postdoctoral training for nurse scientists to incorporate omics-based measures with clinical outcomes research   | <a href="https://nursing.uw.edu/wp-content/uploads/2017/08/Post-Doctoral-Fellowship-Opportunities.pdf?1525975859">https://nursing.uw.edu/wp-content/uploads/2017/08/Post-Doctoral-Fellowship-Opportunities.pdf?1525975859</a> |

<sup>a</sup>This program began on July 1, 2020, after survey administration. Demographic data for current and former fellows are therefore not included. NCATS, National Center for Advancing Translational Sciences; NCI, National Cancer Institute; NHLBI, National Heart, Lung, and Blood Institute; NIA, National Institute on Aging; NIH, National Institutes of Health; NINR, National Institute of Nursing Research; VA, Veterans Affairs.

TABLE 3. DEMOGRAPHIC CHARACTERISTICS OF CURRENT AND FORMER POSTDOCTORAL FELLOWS TRAINED IN PARTICIPATING PROGRAMS (N=73) AND PROGRAM LEADERS (N=21)

| Characteristics                           | Fellows<br>(n=73)<br>n (%) | Program<br>leaders <sup>a</sup> (n=21)<br>n (%) |
|---|----------------------------|---|
| <b>Gender</b>                             |                            |   |
| Female                                    | 55 (75)                    | 14 (67)   |
| Male                                      | 18 (25)                    | 7 (33)  |
| Third/nonbinary                           | 0 (0)                      | 0 (0)   |
| <b>Race</b>                               |                            |   |
| White                                     | 61 (84)                    | 18 (86)   |
| Black                                     | 2 (3)                      | 0 (0)   |
| Asian                                     | 8 (11)                     | 2 (10)  |
| American Indian/Alaska<br>native          | 1 (1)                      | 0 (0)   |
| Native Hawaiian/Other<br>Pacific Islander | 0 (0)                      | 0 (0)   |
| Other/mixed race                          | 1 (1)                      | 1 (4)   |
| <b>Ethnicity</b>                          |                            |   |
| Hispanic                                  | 0 (0)                      | 0 (0)   |
| Non-Hispanic                              | 73 (100)                   | 21 (100)  |
| <b>Educational background</b>             |                            |   |
| MD  | 28 (38)                    | 14 (67)   |
| Completed HPM<br>Fellowship Training      | 12 (16)                    | 1 (5)   |
| Nursing PhD                               | 28 (38)                    | 3 (14)  |
| Pharmacy PhD                              | 1 (1)                      | 0 (0)   |
| Psychology PhD                            | 10 (14)                    | 1 (5)   |
| Sociology PhD                             | 2 (3)                      | 1 (5)   |
| Social Work PhD                           | 1 (1)                      | 0 (0)   |
| Health Policy and<br>Management PhD       | 1 (1)                      | 0 (0)   |
| Epidemiology PhD                          | 1 (1)                      | 0 (0)   |
| Public Health PhD                         | 1 (1)                      | 0 (0)   |
| Nutrition PhD                             | 0 (0)                      | 1 (5)   |
| Physiology/Biophysics PhD                 | 0 (0)                      | 1 (5)   |
| MD/PhD                                    | 0 (0)                      | 0 (0)   |

<sup>a</sup>Some postdoctoral training programs have multiple leaders, for example, T32 directors and codirectors. At institutions with palliative care research opportunities within more general postdoctoral fellowships (Duke, University of Pittsburgh), the faculty leader participating in the Postdoctoral Palliative Care Research Training Collaborative is listed.

HPM, hospice and palliative medicine.

PhDs. Just under a quarter ( $n=17$ ) of fellows have other diverse types of PhD backgrounds in psychology ( $n=10$ ), pharmacy ( $n=1$ ), sociology ( $n=2$ ), social work ( $n=1$ ), health policy and management ( $n=1$ ), epidemiology ( $n=1$ ), and public health ( $n=1$ ) (Table 3).

Current positions of former postdoctoral fellows are listed in Table 4. The majority ( $n=29$ ) hold faculty positions. A smaller number are clinicians in private practice ( $n=8$ ) or working in industry/other research roles ( $n=6$ ).

## Discussion

### Key challenges

The training collaborative has provided a forum for program leaders to share challenges and strategize about future

TABLE 4. CURRENT POSITION OF FORMER POSTDOCTORAL PALLIATIVE CARE FELLOWS TRAINED IN PARTICIPATING PROGRAMS (N=43)

| Position  | n (%)   |
|---|---------|
| Clinician–scientist or PhD–scientist<br>in faculty position | 20 (46) |
| Clinician–educator in faculty position                      | 9 (21)  |
| Clinician in private practice                               | 8 (19)  |
| Industry/other researcher                                   | 6 (14)  |

goals. Key challenges that program leaders are facing relate to recruiting diverse trainees, fostering shared identity, and securing funding support.

### Recruiting diverse trainees

Participating research programs share the challenge of identifying and recruiting qualified postdoctoral fellowship applicants and expanding diversity in the field. While some programs are filling available slots up to two years in advance with local applicants, others are searching for candidates nationally. These recruitment efforts require broad outreach to trainees from multiple disciplines given the diversity of fields represented in palliative care research. For example, PhDs trained within the collaborative to date stem from eight different disciplinary backgrounds. Potential applicants who have relevant backgrounds and interest, but lack prior exposure to palliative care, may not identify themselves as palliative care researchers and therefore may not consider these programs as viable, postdoctoral training opportunities.

Recruitment of palliative care clinicians (e.g., physicians, nurses, and social workers) also presents a common challenge. All institutions within the collaborative have well-established, clinical, palliative care services with the potential for providing a pipeline of clinicians interested in pursuing research training. However, few postdoctoral fellows have clinical palliative care backgrounds. For example, among 28 postdoctoral fellows with MD degrees, only 12 completed Hospice and Palliative Medicine fellowships. Many other clinical fellowships (e.g., cardiology, pulmonology, and oncology) integrate protected time for fellows to conduct research during their clinical training. In contrast, the current model of training for palliative care fellows— one- or two-year clinically focused fellowships that are not typically well integrated with research-focused activities— may not provide adequate time, experiences, or mentorship to foster interest in pursuing additional research training and/or clinician–researcher careers.

Finally, individual programs share the goal of increasing trainee representation from diverse racial and ethnic backgrounds and recognize the need for more diversity within program leadership. Increasing racial and ethnic diversity in the field of palliative care is a core strategy to improve health equity<sup>7</sup> and a priority shared by national organizations, including the National Hospice and Palliative Care Organization<sup>8</sup> and the AAHPM.<sup>9</sup> Recent research demonstrates that many black and Hispanic trainees lack early exposure to palliative care.<sup>10</sup> Initiatives such as pipeline programs are needed to create earlier opportunities to pursue mentored palliative care research for diverse trainees.

### ***Fostering a shared identity and effectively advocating for trainees***

Fostering a shared identity and sense of community as palliative care researchers presents challenges for programs that include trainees from multiple different clinical and disciplinary backgrounds. Several programs within the collaborative include trainees pursuing research that is not related to palliative care. For example, at the University of Pittsburgh, postdoctoral opportunities in palliative care research exist within the NIH/National Center for Advancing Translational Sciences (NCATS)-funded Clinical and Translational Science Fellowship program (TL1), a competitive program open to postdoctoral students from all disciplines conducting translational research. At the University of Washington, the Omics and Symptom Science Fellowship program is not palliative care specific and includes trainees focused on genomics and the microbiome.

Trainees also have research homes in different academic societies—for example, the American Society for Clinical Oncology, Society for Medical Decision Making, and American Geriatrics Society—meaning they may not come together at annual meetings. The inaugural 2020 State of the Science in Hospice and Palliative Care meeting, hosted by the AAHPM, represented an important new opportunity to create a community of palliative care researchers nationally, but was unfortunately postponed due to the COVID-19 pandemic. Recognizing the important challenge of creating a vibrant community of new and senior researchers, participating postdoctoral programs are exploring new ways to connect fellows and leaders virtually.

An additional challenge relates to effectively advocating for trainees who come from varied educational and disciplinary backgrounds. Conversations among interdisciplinary collaborative program leaders have increased understanding of palliative care research training opportunities across disciplines. In some instances, these discussions have led to shared mentoring across institutions.

### ***Funding***

Postdoctoral programs are funded by a variety of different NIH institutes and rely on a core group of faculty mentors within an institute-specific area of research focus—for example, palliative care and geriatrics or palliative care and heart, lung, and blood diseases. This can limit the opportunities for postdoctoral trainees if their research does not fall within the program's area of focus. For example, a trainee cannot conduct pediatric palliative care research within University of Colorado's T32, which is funded by NIA. Furthermore, ongoing funding of a T32 requires an established core group of faculty who have funded grants in the area of focus (e.g., aging and cancer) and express a willingness to serve as mentors.

NIH awards postdoctoral training grants with the expectation that there is an institutional commitment to training. NIH funding does not support principal investigator or mentor time, and securing an adequate number of committed faculty mentors with appropriate expertise in a specific area of focus presents a challenge. Furthermore, in the absence of a palliative care-specific NIH institute, options for additional funding support are limited. Four programs stated that they relied on additional university or foundation sup-

port, and one program is 100% institutionally supported. However, as mentoring time is generally unfunded, to some extent all of the programs depend on at least some degree of institutional support or matching funds. Thus, it is critical that institutions value the development of the palliative care research workforce and are willing to step up with financial and resource support.

### ***Recommendations to increase the palliative care research workforce***

Future goals for the collaborative align with the priorities of palliative care research in general.<sup>11</sup> These recommendations can help to ensure maximal innovation and impact.

**Expand efforts to engage clinician scientists into palliative care research.** Palliative care-trained clinicians have unique perspectives on the unanswered questions and unmet needs in serious illness care. Involving palliative care-trained clinicians in advancing the science of palliative care—while also recognizing the complementary perspectives of researchers with other clinical backgrounds—is critical to ensure that palliative care maintains rigor as an evidence-based specialty in which research and clinical practice are interdependent. This will require routinely incorporating research expectations and experiences into palliative care clinical training programs—ideally, offering an additional one to two years of protected time for research training after clinical fellowship training. These research experiences must include sufficient faculty mentorship to guide trainees on feasible research projects and sufficient protected time for trainees to practice new research skills.

**Expand efforts to engage nonclinician scientists into palliative care research.** Efforts to draw nonclinician scientists to palliative care will ensure that the next generation of researchers have the interdisciplinary skills to address the complex challenges before us. For example, attracting organizational scientists, health economists, and epidemiologists can not only expand the science but also help make findings relevant to policy makers.<sup>12</sup> Social psychologists can inform how support ties or social networks impact the physical and emotional well-being of patients and caregivers.<sup>13</sup> This will require developing partnerships between palliative care programs and programs focused on development of relevant methodological skills. Interdisciplinary graduate programs (e.g., programs that have created successful partnerships between engineering and the humanities) and the tenants of interdisciplinary team science<sup>14</sup> should inform next steps in program development. Expanding the interdisciplinary research workforce will enable palliative care researchers to collectively and creatively tackle critical economic, social, and technological challenges.<sup>15</sup>

**Foster the pipeline of palliative care researchers.** There is an opportunity to garner interest in palliative care research through expanded mentorship of predoctoral and clinical trainees. Pipeline approaches should have an intentional outreach strategy to institutions with higher proportions of underrepresented trainees and offer palliative care research experiences to enrich existing curricula. The

collaborative is committed to attracting and training diverse junior investigators beyond the walls of top-tier institutions with robust palliative care resources. Even more so in the COVID-19 era, palliative care researchers need not be limited by geographical distance or rely on in-person interactions for training. Pipeline approaches must capitalize on available NIH funding mechanisms (e.g., the R25 research education program) and incorporate successful elements from existing remote research training and mentorship models. For example, the Utah Model of live, interactive, video distance education first offered PhD training in 2002, which was then expanded to include intensive, remote, postdoctoral research training in palliative care funded by the National Institute of Nursing Research.

**Increase the number of palliative care postdoctoral training programs.** Increasing the number of diverse postdoctoral trainees will lead to an increased demand for training positions. Members of the collaborative have been successful in competing for programmatic support and can be helpful as other institutions start training programs. The collaborative envisions serving as an incubator for institutions that do not yet have a formal postdoctoral training program while working toward an expanded commitment from NIH to support palliative care research training at geographically diverse institutions across the United States. Through the collaborative, mentors can share information, resources, and educational opportunities for research skills and career development.

**Expand funding support.** There is an urgent need to secure additional funding to support faculty mentorship, recruit diverse faculty to serve as role models, continue activities to build a national community of postdoctoral fellows, and expand opportunities for trainees to become successful in transitioning to career development awards. Organizations working in palliative care research, including the National Palliative Care Research Center and the Palliative Care Research Cooperative, require sustainable funding plans. NIH funding for nondisease-based, career development grants is also needed to increase the likelihood of success for palliative care trainees pursuing academic careers. The National Institute on Aging's K76 Paul Beeson Emerging Leaders Career Development Award is an example of a funding mechanism in geriatrics, which could be used as a model for palliative care research career development. Such funding will in turn expand the number of mentors available for future palliative care research trainees.

### Limitations

This article describes the programs participating in the National Postdoctoral Palliative Care Research Training Collaborative. While those participating as trainees and leadership represent a broad range of disciplines and backgrounds, the collaborative does not include all palliative care postdoctoral training programs. Furthermore, there are postdoctoral palliative care training opportunities outside of formal programs, which are also not included in this discussion.

### Conclusions

The National Postdoctoral Palliative Care Research Training Collaborative fills an important role in creating a community for palliative care research trainees. The interdisciplinary nature of palliative care research is apparent from the backgrounds of trainees, who may benefit from an equally broad network of support through the collaborative. This partnership across institutions offers unique opportunities for trainees and faculty to network and collaborate. This work has also been critical in developing strategies to address commonly shared challenges. The collaborative envisions a future landscape of postdoctoral palliative care research training that includes expanded research training opportunities within clinical fellowships, interdisciplinary graduate programs, pipeline approaches to expand mentorship opportunities for diverse predoctoral and clinical trainees, postdoctoral research training programs at more academic institutions across the United States, and expanded NIH and foundation funding to ensure sustainable support for growing palliative care research careers.

### Authorship Confirmation Statement

All authors have contributed to the development and production of this article and have approved the draft.

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