# Pulmonary and Critical Care Medicine Program Directors' Attitudes toward Training in Medical Education

## A Nationwide Survey Study

Jeremy B. Richards[1], Jennifer W. McCallister[2], and Peter H. Lenz[3]

[1]Division of Pulmonary, Critical Care, and Sleep Medicine, Medical University of South Carolina, Charleston, South Carolina; [2]Division of Pulmonary, Allergy, Critical Care, and Sleep Medicine, The Ohio State University Wexner Medical Center, Columbus, Ohio; [3]Division of Pulmonary Critical Care, and Sleep Medicine, University of Cincinnati College of Medicine, Cincinnati, Ohio

ORCID IDs: 0000-0002-8922-1955 (J.B.R.); 0000-0002-2710-7268 (J.W.M.).

## Abstract

**Rationale:** Many pulmonary and critical care medicine (PCCM) fellows are interested in improving their teaching skills as well as learning about careers as clinician educators. Educational opportunities in PCCM fellowship programs designed to address these interests have not been well characterized in U.S. training programs.

**Objectives:** We aimed to characterize educational content and structure for training fellows to teach in PCCM fellowship programs. We evaluated three major domains: (*1*) existing educational opportunities, (*2*) PCCM program directors' attitudes toward the importance of teaching fellows how to teach, and (*3*) potential components of an optimal teaching skills curriculum for PCCM fellows.

**Methods:** We surveyed program and associate program directors who were members of the Association of Pulmonary and Critical Care Medicine Program Directors in 2014. Survey domains included existing teaching skills content and structure, presence of a formal medical education curriculum or clinician educator track, perceived barriers to teaching fellows teaching skills, and open-ended qualitative inquiries about the ideal curricula. Data were analyzed both quantitatively and qualitatively.

**Measurements and Main Results:** Of 158 invited Association of Pulmonary and Critical Care Medicine Program Directors members, 85 program directors and associate directors responded (53.8% response rate). Annual curricular time dedicated to teaching skills varied widely (median, 3 h; mean, 5.4 h; interquartile range, 2.0–6.3 h), with 17 respondents (20%) allotting no time to teaching fellows to teach and 14 respondents (17%) dedicating more than 10 hours. Survey participants stated that the optimal duration for training fellows in teaching skills was significantly less than what they reported was actually occurring (median optimal duration, 1.5 h/yr; mean, 2.1 h/yr; interquartile range, 1.5–3.5 h/yr; $P < 0.001$). Only 28 (33.7%) had a formal curriculum for teaching medical education skills. Qualitative analyses identified several barriers to implementing formal teaching skills curricula, including "time," "financial resources," "competing priorities," and "lack of expert faculty."

**Conclusions:** While prior work has demonstrated that fellows are interested in obtaining medical education skills, PCCM program directors and associate directors noted significant challenges to implementing formal educational opportunities to teach fellows these skills. Effective strategies are needed to design, implement, sustain, and assess teaching skills curricula for PCCM fellowships.

**Keywords:** clinician educator; curriculum; fellowship training; graduate medical education; perception

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Correspondence and requests for reprints should be addressed to Jeremy B. Richards, M.D., M.A., Division of Pulmonary, Critical Care, and Sleep Medicine, Medical University of South Carolina, 96 Jonathan Lucas Street, Suite 812-CSB, MSC 630, Charleston, SC 29425. E-mail: jeremyrichardsmd@gmail.com

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Many pulmonary and critical care fellows are interested in developing teaching skills, and one prior study demonstrated that nearly half of a cohort of pulmonary and critical care medicine (PCCM) fellows were "interested" or "very interested" in pursuing careers as medical educators (1). The importance of developing fellows' teaching skills is further emphasized in the Accreditation Council for Graduate Medical Education's milestones for subspecialty training programs in internal

medicine, as teaching skills are repeatedly emphasized and required as criteria to determine readiness for unsupervised practice (2).

While many pulmonary, critical care, and PCCM fellows are interested in acquiring skills as clinician educators, the best strategy for teaching PCCM fellows how to become more effective teachers is uncertain. Specific curricular approaches include obligatory experiences within fellowship training (3), focused clinician educator tracks, and medical education fellowships.

Clinician educator tracks are increasingly prevalent in graduate medical education training programs. Distinct from medical education fellowships, clinician educator tracks in both residency (4, 5) and fellowship training (6, 7) programs are incorporated into existing training programs and are designed to provide knowledge and skills intended to prepare trainees for careers in medical education. However, designing, implementing, and sustaining clinician educator programs require resources and effort, and broad implementation of clinician educator tracks may not be tenable for all pulmonary, critical care, and PCCM fellowship programs.

Medical education fellowships are trainee or faculty development activities independent of a clinical training program (8). Medical education fellowships vary in structure and content, but they are defined as extended faculty development activities focused on medical education skills for a single cohort of faculty or fellows (9). Medical education fellowships are separate, focused training experiences in addition to rather than incorporated into clinical training programs.

In this context, over the past 3 decades, clinician educator pathways are increasingly recognized as a pathway for promotion in academic institutions (10–12). In PCCM specifically, the importance of achieving both excellence in pedagogy and contributing scholarly work to the field of medical education have been increasingly recognized as valuable attributes (13–15). Growing career and promotion opportunities for pulmonary, critical care, and PCCM fellows interested in exploring careers as clinician educators demonstrate the need for educational resources and curricula for fellows.

While independent medical education fellowships increased significantly in the 1990s and 2000s (14), the extent to which PCCM fellowship programs are incorporating training into medical education knowledge and teaching skills or the prevalence of clinician educator tracks in PCCM training is unknown. Training program directors have important perspectives on whether PCCM fellows are acquiring teaching skills during fellowship, what may be necessary to optimize this type of education, and what is logistically and institutionally possible with regard to teaching fellows to become better teachers and developing clinician educator pathways. We sought to evaluate the current status of training fellows in pulmonary, critical care, and PCCM to teach in the United States by surveying fellowship associate program directors and program directors.

## Methods

### Survey Development

We performed a literature search in an effort to identify existing survey tools, and we identified two previously described surveys applicable to our study (1, 14). Relevant items from these surveys were extracted, modified as needed to address program and associate program directors, and combined with additional questions specific to our study (16). After we developed the survey tool, we reviewed questions iteratively (J.B.R. and P.H.L.) and revised them until consensus regarding content and clarity was reached. The survey was then pilot tested with a cohort of PCCM faculty at the authors' institutions, and their comments were used to further modify and revise the questions to optimize clarity and validity (17). A second and third round of pilot testing was performed with two distinct cohorts of faculty and senior fellows. After the third round of testing, no further modifications were necessary, and the survey was determined to have adequate content and construct validity.

The final version of the survey was designed to assess three major domains: (*1*) the current state of teaching curricula at each respondent's institution, (*2*) program directors' attitudes toward the importance of teaching fellows to teach as a component of their PCCM training, and (*3*) potential components of an optimal curriculum to teach fellows teaching skills (*see* Appendix E1 in the online supplement).

### Survey Dissemination

The survey was electronically distributed to members of the Association of Pulmonary and Critical Care Medicine Program Directors (APCCMPD) via e-mail invitations that included an anonymous survey link (Qualtrics, Provo, UT), a brief description of the study protocol, and approval and consent links. The invited APCCMPD members included program and associate program directors from pulmonary, critical care and combined pulmonary and critical care fellowship programs. There were no incentives offered for completing the survey. The e-mail invitation and link to the survey were sent to each potential participant once weekly for 3 weeks. The study protocol was reviewed by the institutional review boards at the University of Cincinnati and Beth Israel Deaconess Medical Center, and it was determined to be exempt from review.

### Data Analysis

Data were imported into a Microsoft Excel spreadsheet file (Microsoft Corp., Redmond, WA), and quantitative results derived from Likert-style questions were then transferred to JMP Pro version 12.0 files (SAS Institute Inc., Cary, NC). To protect anonymity, data were analyzed at the level of individual participants rather than by PCCM fellowship program. Quantitative data were analyzed descriptively using interquartile ranges (IQRs) for data not normally distributed. $\chi^2$ analyses were used to determine between-group comparisons. Qualitative data were transcribed and coded, and major themes were extracted until saturation was achieved (18). Specifically, two investigators (J.B.R. and P.H.L.) engaged in multiple rounds of reading the open-ended results and coding them to identify major themes. Once themes were identified, all open-ended responses were coded by hand. Final coding was performed by all authors and compiled into one document after consensus was achieved, and representative quotations were identified for major themes.

## Results

### Completion Data

A total of 158 programs were members of the APCCMPD at the time of survey initiation. Surveys were sent to both

**Table 1.** Self-designated positions of survey respondents (n = 85)

| Position Title | Number of Respondents (Percentage of Total Respondents) |
|---|---|
| Program director for pulmonary and critical care fellowship | 52 (61.2%) |
| Program director for pulmonary fellowship | 8 (9.4%) |
| Program director for critical care fellowship | 10 (11.8%) |
| Associate program director for pulmonary and critical care fellowship | 10 (11.8%) |
| Associate program director for pulmonary fellowship | 0 (0%) |
| Associate program director for critical care fellowship | 1 (1.2%) |
| Other position | 4 (4.7%) |

program directors and associate program directors. We received 85 unique responses. The majority (85%) of respondents were program directors. Of these, 52 were directors of PCCM fellowships, 8 were directors of pulmonary fellowships, and 10 directed critical care medicine programs (Table 1). Of the 85 respondents who started the survey, 82 answered all of the core survey questions (96.5% completion rate). Results are grouped by the three major domains assessed with the survey instrument.

### Current State of Teaching Skills Training

Of the individuals who participated in the survey, only 28 (33.7%) reported that their program had a formal curriculum to teach fellows teaching skills. There was significant diversity between respondents' reporting of the number of hours per year of formal curricular time dedicated to teaching fellows to teach (mean, 5.4 h; median, 3 h; IQR, 2.0–6.3 h), with 17 respondents (20%) reporting that they dedicated no time to teaching fellows to teach and 14 respondents (17%) reporting that they dedicated more than 10 hours of formal curricular time.

Respondents from programs with formal curricula dedicated to improving teaching skills to their fellows reported considerable variability in content (Table 2). Heterogeneity with regard to instructional methods used was also observed (Table 3).

### Actual versus Ideal Components of a Teaching Skills Curriculum

The content offered by respondents from programs that teach fellows medical education skills differed from how much time respondents felt should optimally be dedicated to teaching fellows medical education skills, with a mean optimal duration of 2.1 hours per year and a median of 1.5 hours (IQR, 1.5–3.5 h). The difference between actual and optimal hours dedicated to teaching fellows to teach was significant in $\chi^2$ analyses ($F$-statistic, 3.90; $P < 0.001$).

The instructional methods used in fellowship programs with existing formal curricula were similar to what all respondents identified as components of an "ideal" formal curriculum for teaching fellows medical education skills. Specifically, the majority of respondents identified "presentation skills" (81.7%), "PowerPoint skills" (52.9%), "small-group teaching skills" (52.9%), "giving feedback" (51.8%), and "evaluating learners" (41.2%) as the most important ideal curricular components.

### Barriers to Implementing a Curriculum for Teaching Fellows to Teach

Survey respondents whose programs did not have a formal curriculum for training fellows to teach were asked to describe barriers to implementing such a program. Themes that arose included "time," "financial resources," "competing priorities," "lack of expert faculty," and "fellows not interested" (Table 4). Most survey participants offered only one barrier (34 [69.4%] of 49), and no one identified more than three barriers. While time was the most commonly cited barrier, it frequently overlapped with other themes. However, as one respondent noted, time influenced faculty participation in a teaching curriculum: "[The major barrier is] time that faculty can devote to this experience. [Also,] lack of confidence from faculty for teaching this." When asked how to best assess a formal curriculum to teach fellows teaching skills, extracted themes included "faculty observation of fellows teaching," "learner feedback," "learner evaluations," "objective structured teaching exercises," and "formal assessment of presentations."

Other perspectives and considerations regarding development and implementation of a formal curriculum to teach fellows teaching skills were assessed, and respondents' open-ended answers demonstrated variability in program and associate program director attitudes toward such a curriculum. Responses ranged widely, although some themes were identified among subgroups of respondents: "importance of curricular uniformity," "fellows' time and effort are necessary," "dynamic and active teaching methods are effective," and "can't force fellows to learn to teach." Overall, these responses indicated concerns for obligating fellows to participate in a teaching curriculum (6 [20.7%] of 29 respondents). Concerns that characterized these responses were time, fellows' interest in learning to teach, competing priorities in the existing curriculum, and competing priorities with fellows' clinical activities.

The nature of responses was reflected in contrasting representative quotes from

**Table 2.** Content domains of existing formal teaching curricula in pulmonary, critical care, and pulmonary and critical care medicine programs (n = 28 respondents)

| Content Domain | Number of Respondents (Percentage of Respondents with Formal Teaching Curricula) |
|---|---|
| Developing presentation skills | 27 (96.4%) |
| How to prepare PowerPoint presentations | 22 (78.6%) |
| How to give feedback | 14 (50.0%) |
| Small-group teaching skills | 14 (50%) |
| Learner evaluation | 8 (28.6%) |
| Adult learning theory | 8 (28.6%) |

**Table 3.** Instructional methods used in formal teaching curricula in pulmonary, critical care, and pulmonary and critical care medicine fellowships (n = 28 respondents)

| Instructional Methods | Number of Respondents (Percentage of Respondents with Formal Medical Education Curricula) |
|---|---|
| Large-group teaching sessions | 28 (100.0%) |
| Interactive small-group teaching sessions | 28 (100.0%) |
| Faculty observation and evaluation of fellow teaching | 21 (75.0%) |
| Department- or hospital-level educational sessions (e.g., master teacher program or clinician educator series) | 13 (46.4%) |
| Online educational models | 12 (42.9%) |
| Longitudinal clinician educator track | 9 (32.1%) |

two different respondents. One respondent stated, "[A formal curriculum teaching fellows teaching skills] can become a very significant time requirement in an already overwhelmingly busy schedule for our fellows. I do not support making it mandatory for all fellows (some have no aptitude and no interest whatsoever in it), but I do believe that it should be available for those interested." Another respondent stated, "It's important, but those fellows who are interested in teaching will naturally rise to the occasion to do teaching and learn more about it. It's hard to add yet another mandatory task to their training."

### Attitudes toward Implementing a Teaching Skills Curriculum

Overall, 44 respondents (53.0%) felt that a formal curriculum that instructs fellows how to teach should be a mandatory component of PCCM fellowship programs, as compared with 39 respondents (47.0%) who were opposed to a mandatory teaching curriculum. Furthermore, the majority of respondents were in favor of fellows' undergoing objective structured teaching exercises with faculty observation and evaluation (59% in favor vs. 41% opposed.)

## Discussion

Although PCCM fellows are increasingly interested in developing educational skills (1, 19), our study demonstrates wide variability between learning opportunities for fellows in pulmonary, critical care, and PCCM programs in the United States. Only one-third of those surveyed indicated that their fellowship programs had formal curricula or clinician educator pathways to train fellows teaching skills. Respondents voiced significant concerns about the barriers, content, and audience for formal curricula in their own training programs.

Our survey results demonstrate discordance between the number of hours actually devoted to teaching fellows how to teach and the amount of time program directors feel should optimally be dedicated to it. It is possible that the difference between optimal and actual hours devoted to instruction on teaching skills is due to the variability in time dedicated to teaching fellows teaching skills across the programs included in our study. The presence of a formal curriculum focused on improving teaching skills in some programs may have increased the number of hours actually spent teaching these skills in the overall cohort, resulting in a disparity between actual time spent and perceived optimal time needed for developing teaching skills.

For programs without a teaching curriculum, our qualitative results indicate that time pressures and competing priorities may inform the significant differences in actual and optimal time. Although program directors generally endorse teaching skills as an important component of fellowship education, determining how to teach those skills efficiently and effectively is clearly perceived as a challenge.

That the program and associate program directors in our study noted significant challenges to implementing formal educational opportunities to train fellows how to teach represents an opportunity to develop educational strategies at a national level. Our survey results demonstrate that there are significant differences among pulmonary, critical care, and PCCM fellowship training program stakeholders with regard to medical education skill training. Determining the most effective practices with regard to curricular design, content, implementation, and assessment may provide a foundation for addressing the barriers to providing more homogeneous opportunities for learning medical education skills for all PCCM fellows.

To accomplish this, lessons learned from the educators' experiences in developing, implementing, sustaining, and assessing medical education fellowship programs may be valuable in developing an effective and actionable educational strategy. A reflective analysis of three yearlong

**Table 4.** Perceived barriers to implementing a teaching curriculum (n = 49 respondents)

| Theme | Cumulative Frequency (*n* [%]) | Representative Quote |
|---|---|---|
| Lack of time | 17 (34.7%) | "Fellows have a day off a week, limited hours, difficult to get the medical basics covered let alone adding a formal educational 'teaching' program." |
| Financial resources | 5 (10.2%) | "We need more departmental resources to protect faculty time to prepare such a curriculum." |
| Competing priorities | 3 (6.1%) | "There are a lot of things to cover bedsides instruction on teaching. Also, if the fellow is not going into academics, curriculum should be directed at needs." |
| Lack of expert faculty | 10 (20.4%) | "Faculty have not received training in teaching as in education theory and in teacher training courses." |
| Fellows not interested | 3 (6.1%) | "Only a subset of fellows want to be clinician educators; time should be dedicated to that group of fellows, not all fellows. I mean, not all fellows have lectures on how to perform Western blots!" |

medical education fellowship programs identified 10 specific strategies for developing and maintaining successful curricula, including "defining an operating philosophy, values, and goals," "employing a basic approach to adult learning," and "creating optimum learning opportunities for the fellow to acquire and practice skills delineated in the curriculum," among others (20). These and other lessons and best practices learned from clinician educator tracks and medical education fellowship programs can provide valuable strategies for addressing how best to teach pulmonary, critical care, and PCCM fellows how to teach (4–6, 21–23).

Determining the appropriate focus for formal fellow teaching curricula is important, as our results demonstrate equipoise among program directors regarding whether all fellows should receive formalized instruction on how to teach or whether such opportunities should be reserved for those fellows interested in careers as clinician educators in the form of dedicated clinician educator tracks. Such a determination should complement decisions regarding the content and structure of formal curricula to teach fellows how to teach.

This study has several strengths, as it was a nationwide survey encompassing a majority of respondents from PCCM fellowship programs in the United States. The response rate was better than established response rates reported in the literature (24). Regardless, nonresponder bias could have influenced our results. Of the invited participants who initiated the survey, the rate of attrition was minimal, as 96.5% of respondents completed all of the core survey questions. Finally, our survey incorporated open-ended questions that yielded descriptive and robust comments from participants, providing interpretable quantitative and qualitative results.

Our study also has some limitations. In addition to nonresponder bias, using APCCMPD member institutions as the cohort of potential respondents may have biased the results to overrepresent PCCM fellowship programs as compared with pulmonary or critical care fellowship programs. In addition, the online survey interface limited the breadth and depth of data obtained from participants. The survey design did not allow us to compare the results of individual respondents in a detailed fashion, and we could not account for programs where more than one participant may have completed the survey. Follow-up questions, comparative group analyses, requests for clarification, and identification of respondents' institutions were not possible with the anonymous, Internet-based format of our survey, limiting deeper exploration of results.

In summary, in this survey study, we found significant variability in the teaching curricula of pulmonary, critical care, and PCCM fellowship programs in the United States. Differences in time dedicated to teaching fellows how to teach, as well as differences in content and organization between fellowship programs, were notable, with a minority of fellowship programs offering a formal curriculum to teach fellows how to teach. Furthermore, program and associate program directors identified significant barriers to developing, implementing, sustaining, and assessing these skills in their fellowship programs. Our results indicate that there is an opportunity to develop effective educational strategies to design, implement, sustain, and assess structured and uniform curricula for teaching trainees to teach in PCCM fellowships. ■

**Author disclosures** are available with the text of this article at www.atsjournals.org.

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