



The current state of fellowship training in pulmonary artery catheter placement and data interpretation: A national survey of pulmonary and critical care fellowship program directors^{☆,☆☆}

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Abstract

Purpose: Given decreasing use of pulmonary artery (PA) catheterization, we sought to evaluate whether current pulmonary and critical care fellows have adequate opportunity to obtain proficiency in PA catheter placement and data interpretation.

Methods: All US pulmonary and critical care program directors were invited to participate in an anonymous online survey regarding current training opportunities in PA catheterization.

Results: The response rate was 51% (69/136). Eighty-three percent reported that the number of PA catheterizations performed by fellows within their program has decreased in the past decade. Fifty-four percent estimated that their fellows currently participate in less than 10 supervised procedures during fellowship. The most frequently identified barriers to training were procedure volume and reluctance to place PA catheters in the medical intensive care unit. Forty-three percent of respondents agreed that training in PA catheter placement is currently adequate within their program, and 55% agreed that training in data interpretation is adequate. Only 39% of respondents believe that PA catheter placement should continue to be an Accreditation Council for Graduate Medical Education training requirement.

Conclusions: Many current pulmonary and critical care fellows do not have the opportunity to gain proficiency in PA catheterization. Fellowship training programs should consider alternate means of training fellows in PA catheter data interpretation, such as simulation.

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[☆] Dr Tukey had full access to the data and vouches for its integrity. Dr Tukey contributed to the study design, statistical analysis, and writing of the manuscript. Dr Wiener contributed to the study design, statistical analysis, and writing of the manuscript.

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1. Introduction

Once considered a “defining element of critical care” [1], pulmonary artery (PA) catheter use has decreased dramatically in the United States and Canada over the past few decades [2,3]. Even before this decrease in use, there was a considerable variability in knowledge about PA catheter insertion and data interpretation among critical care nurses and physicians [4-8]. More recent studies suggest that knowledge of use and interpretation of data from PA catheters remains a concern [9-11].

Fellowship is considered the main opportunity for pulmonary and critical care physicians to hone their skills at PA catheter placement and data interpretation. Although studies suggest that the ubiquitous use of the PA catheter does not improve outcomes [12-18], the procedure remains the standard of care for the diagnosis and management of pulmonary hypertension [19] and has a role in selected critically ill patients [20]. Proficiency in PA catheter insertion and data interpretation remains an Accreditation Council for Graduate Medical Education (ACGME) requirement for pulmonary and critical care fellowship training programs [21]. However, in light of decreasing use of the PA catheter nationally, it is unknown whether current pulmonary and critical care fellows in the United States continue to have adequate opportunity during fellowship to learn to place PA catheters and interpret their results [22]. We sought to address this question by surveying US pulmonary and critical care program directors regarding current fellowship training in PA catheter placement and interpretation.

2. Methods

We developed a 17-item self-administered survey consisting of both multiple-choice and fill-in-the-blank items. The survey included items in 3 domains: (1) training program characteristics, (2) current training opportunities in PA catheterization, and (3) barriers to training in PA catheterization. Response sets for survey questions evaluating the adequacy of current fellowship training and barriers to training used a 5-point Likert scale, with responses ranging from 1 (strongly agree/very important) to 5 (strongly disagree/very unimportant). Ten pulmonary and critical care physicians, including both faculty and fellows, assessed the survey for face validity, content validity, and clarity of individual items; we revised the survey based on their feedback. The final version of the survey is available in online Appendix 1.

In February 2012, all adult pulmonary and critical care fellowship program directors in the United States were invited to participate in an anonymous and voluntary online survey using <http://surveymonkey.com>. A listing of current pulmonary and critical care fellowship program directors was obtained from the American Thoracic Society Web site (<http://www.thoracic.org>) and confirmed with the American Medical Association Web site (<http://www.ama-assn.org/>).

To maximize response rate, a reminder e-mail with the link to the survey was sent at 2 and 4 weeks, for a total of 3 invitations to participate. No compensation was offered for study participation. This study was reviewed by the institutional review board at Boston University Medical Center and determined to be exempt.

We calculated descriptive statistics for continuous variables with medians and interquartile ranges. We collapsed 5-point response sets into 3 categories (eg, “strongly agree” and “agree” were combined, “no opinion” was left as its own category, and “disagree” and “strongly disagree” were combined) for purposes of statistical analysis. Programs in which fellows were estimated to perform fewer than 10 supervised PA catheter procedures during fellowship training were classified as having decreased training opportunities. Associations between training program characteristics and decreased training opportunities were analyzed using χ^2 analysis and Fisher exact test when there were expected cell counts less than 5. For all statistics, a 2-sided *P* value of less than .05 was considered statistically significant. Statistical tests were performed using the SAS version 9.1.3 statistical software (Cary, NC).

3. Results

3.1. Overview

A total of 69 of the 136 US pulmonary and critical care fellowship program directors responded to the survey (response rate, 51%). Table 1 shows the characteristics of the responding training programs. Of note, most programs rely on lectures (88.4%; 95% confidence interval [CI], 80.9%-96.0%) and clinical opportunities (82.6%; 95% CI, 73.7%-91.6%) for PA catheterization as the primary means of training fellows in PA catheter placement and data interpretation; alternative training mechanisms such as simulation (24.6%; 95% CI, 14.5%-34.8%) and Web-based training (31.9%; 95% CI, 20.9%-42.9%) were reported far less often.

3.2. Current fellowship training opportunities

More than half (53.6%; 95% CI, 41.9%-65.4%) of respondents estimated that current fellows in their program perform fewer than 10 supervised PA catheterization procedures during fellowship training (Fig. 1). Most respondents (82.6%; 95% CI, 73.7%-91.6%) reported that training opportunities for fellows had either decreased or significantly decreased during the past 10 years. Less than half of program directors (42.7%; 95% CI, 30.9%-54.4%) agreed that current fellowship training in PA catheter placement is adequate, and 55.1% (95% CI, 43.3%-66.8%) considered training in data interpretation adequate. More than half (52.2%; 95% CI, 40.3%-64.2%) of program directors estimated that fellows should place and interpret

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