



## Survey of Certified Asthma Educator (AE-C) Pharmacists – Who are they and how is this Credential Being Used?

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### Abstract

**Objective:** A survey was developed and distributed to pharmacists who have earned the certified asthma educator credential (AE-C) to assess asthma education services provided and their perceived value of the AE-C.

**Design:** A 28 item survey was developed, pretested and distributed electronically.

**Participants:** 224 AE-C certified pharmacists practicing within the United States were invited to participate.

**Main Outcome Measures:** Information pertaining to the level of education, professional affiliations, and practice setting was collected along with other demographic attributes. We also inquired about the types of asthma education services provided, related clinical activities, and whether AE-C pharmacists or their employers had received reimbursement for time spent providing such services.

**Results:** A total of 57 (25.4%) pharmacists from 30 different states completed the survey. Respondents were primarily female (79.2%); had earned a Pharm.D. degree (81.1%); completed a post-graduate year 1 (PGY1) residency (37.7%); with most practicing in either an ambulatory care (49.1%) or academic (35.8%) setting. The majority of respondents (84.4%) indicated they would recommend the AE-C credential to a pharmacist colleague. Professional advancement, improved confidence in managing asthma, and increased credibility were among the reported benefits of the AE-C. Limited recognition of the credential among pharmacists and lack of reimbursement for services were perceived barriers to pursuing an AE-C.

**Conclusion:** AE-C pharmacists are playing an integral role in managing patients with asthma. The AE-C credential has been viewed favorably by most pharmacists who have earned this credential. However, efforts to increase awareness of the AE-C among pharmacists may be necessary.

**Keywords:** Asthma; Education; Pharmacist; AE-C; Certified asthma educator

### Article Relevance and Contribution to Literature

There is limited data related to the roles and responsibilities certified asthma educators are currently fulfilling throughout the United States. There is even less data describing the involvement of pharmacists practicing within these roles. This article addresses demographic information related to a sample of AE-C pharmacists, including the average amount of time spent educating patients with asthma, as well as the average number of patients seen per week. The authors also highlight rationale for more pharmacists to become certified. A reflection of barriers to this cause is also addressed.

### Introduction

Asthma is a treatable chronic health condition affecting an estimated 25.7 million Americans, including 7.0 million children in 2010 [1]. The economic burden of asthma is significant with direct and indirect expenditures totaling an estimated \$56 billion dollars annually [2]. Bronchoconstriction, airway hyperresponsiveness, and bronchial

inflammation are hallmark features of asthma that often lead to episodes of reversible airflow obstruction. When asthma is very poorly controlled, frequent exacerbations are often imminent and in some instances life-threatening.

Current guidelines emphasize the importance of establishing and maintaining adequate asthma control to help ensure patients are able to participate in normal daily activities without experiencing symptoms or limitations in activity [3]. Quality education is recognized as an integral component to care and should be designed to help patients identify and manage asthma triggers effectively. Other vital components involve adherence to therapy, appropriate medication selection, and proper use of inhalation devices. A standardized process to certify clinician competency in asthma management may help identify individuals who have demonstrated this expertise. Currently, The National Asthma Educator Certification Board (NAECB) is the only organization in the United States with a national certification process [4].

Pharmacists are well-situated within the healthcare system to impact these and other outcomes of patients with asthma. An estimated 250 million patients visit a pharmacy in the United States each week, where patients have access to pharmacy services [5]. A

pharmacist's unique expertise in pharmacotherapy, access to medication refill history, and frequent encounters with a patient (often monthly) place pharmacists in an excellent position to educate patients with asthma.

The National Asthma Educator Certification Board (NAECB) was established in February 2000 as a non-profit organization with the mission to "promote optimal asthma management and quality of life among individuals with asthma, their families, and communities by advancing excellence in asthma education through the certified asthma educator process." The AE-C certification examination consists of four major content areas based on national job analysis and sound scientific evidence. Candidates are allowed 3½ hours to answer 175 questions (150 scored questions, 25 unidentified pretest questions). Performance on the pretest questions does not affect a candidate's final score. The examination is written and reviewed by the NAECB Examination Committee, which consists of large team of asthma experts representing multiple disciplines involved in asthma education. A contracted team of psychometricians work closely with the NAECB to assist in the development, administration, scoring and analysis of its examination.

The examination is offered electronically at multiple testing sites throughout the United States [4]. Since 2002, over 3400 licensed or credentialed health professionals have successfully attained certified asthma educator status (AE-C) [6]. Nurses and respiratory therapists account for the largest portion of certificants, while pharmacists comprise less than 5% of certificants.

## Objective

The NAECB Board of Directors approved this study in order to learn more about pharmacists who have earned the AE-C credential. The Board was particularly interested in the types of asthma education services provided by pharmacists and whether reimbursement was received for these services.

## Methods

A survey was developed by the authors and pretested by five pharmacy practice faculty with an expertise in asthma care. The survey was adapted from an earlier survey developed by Cataletto and colleagues, which was used to describe the workforce of certified asthma educators (i.e. certificants from all disciplines) [6]. Questions were modified to learn more about the population of AE-C pharmacists specifically. All five reviewers pre-tested the survey independently over a two week period and reviewed the assigned questionnaire for clarity and content. Space was provided after each question to gather feedback. The final 28 item survey was approved by the MCPHS University and St. Louis College of Pharmacy Institutional Review Boards, as well as, the NAECB Research Committee. The survey was then distributed by the NAECB to the known 224 AE-C pharmacists nationwide using the Constant Contact marketing tool online on April 6, 2013. Three email reminders were sent out during the month of April 2013 before it was closed on May 6, 2013. No incentives were provided and participation was voluntary. Respondent identifiers were removed prior to analysis to maintain anonymity.

Respondents were categorized as providing direct patient care responsibilities (i.e. "practicing") if dedicated at least one hour to providing asthma related services with at least one patient seen per week. According to the Council on Credentialing in Pharmacy, "direct

patient care practice involves the pharmacist's direct observation of the patient and his or her contributions to the selection, modification, and monitoring of patient-specific drug therapy [7]." In some instances, pharmacists with direct and non-direct patient care responsibilities were reported in aggregate (i.e. "all respondents"), primarily for activities that did not directly involve patient care. Descriptive statistical analyses were performed using Microsoft Excel 2010.

## Results

### Demographics

A total of 59 of the 224 (26.3%) AE-C pharmacists responded to the survey. Two respondents failed to complete the survey in its entirety and were therefore excluded from the final analysis. Of the remaining respondents, twelve reported they were no longer involved in providing direct patient care. However, the activities reported by these individuals were relevant to the AE-C credential and were therefore included in the final analysis. The majority of respondents were female (79.2%) and Caucasian (83.0%); had earned a doctor of pharmacy degree (81.1%); with 37.7% having also completed a post-graduate year 1 (PGY1) residency. Respondents had been licensed for an average of 14.0 years (SD ± 9.6 years) (Table 1).

Gender	% Respondents
Female	42 (79.2%)
Ethnicity	
African American	2 (3.8%)
Asian	3 (5.7%)
Caucasian	44 (83.0%)
Hispanic	1 (1.9%)
Other	3 (5.7%)
Education*	
Bachelor	24 (45.3%)
Doctor of Pharmacy	43 (81.1%)
MS	2 (3.8%)
Other	2 (3.8%)
Additional Education & Training*	
PGY1	20 (37.7%)
PGY2	4 (7.5%)
Fellowship	1 (1.9%)
Other	9 (17%)
Practice Setting*	
Ambulatory Care	26 (49.1%)
Academia	19 (35.8%)
Hospital Pharmacy – Inpatient	9 (17.0%)

Community Pharmacy – Independent	8 (15.1%)
Community Pharmacy – Retail Chain	6 (11.3%)
Hospital Pharmacy – Outpatient	2 (3.8%)
In training (e.g. Resident)	2 (3.8%)
Other (please specify)	11 (20.8%)

**Table 1:** Demographic Characteristics of AE-C Pharmacist Respondents (% Respondents).

All Respondents (n=53)

\*Percentages of respondents do not add to 100% because multiple responses were allowed for these questions.

A total of 30 states were represented by respondents, with relatively equal distribution across the following four regions: Northeast, Midwest, West, and South. The majority of respondents reported practicing in an urban area (77.4%).

The most frequently cited practice settings included ambulatory care (49.1%) followed by academia (35.8%). Respondents were permitted to select multiple categories to best describe their practice setting. A total of 45.3% of respondents selected two or more practice settings. More than half of those who selected “academia” also selected “ambulatory care” (18.9% of the total), suggesting overlap between these two settings. The option “other” was selected by 18.9% of respondents, most of which practiced in a managed care setting (e.g. PBM).

### Asthma-related clinical activities

Certified pharmacists spent an average of 6.0 hours (SD ± 7.4 hours) providing asthma related clinical activities each week. These activities included device and inhalation technique counseling, product selection, asthma education, assessing asthma control, and monitoring response to therapy (Table 2). Additionally, respondents were involved with other clinical measures such as pulmonary function testing (PFT) and providing input and/or education on asthma action plans.

Disease state asthma education was the most frequently selected activity by all respondents (83.1%) and by those with direct patient care responsibilities (95.6%). “Device technique counseling” followed by “monitoring response to therapy” were the next activities most frequently selected by all respondents, as well as those with direct patient care responsibilities; (76.3% versus 91.1%) and (67.8% versus 82.2%), respectively.

Pharmacists with the AE-C credential with direct patient care responsibilities visited with a mean of 10.0 patients/week (SD ± 17.1 patients/week) with the average visit lasting 25.8 minutes (SD ± 16.4 minutes). Many were responsible for either completing and/or educating patients on an individualized asthma action plan; 62.2% and 68.9%, respectively. Less were involved with administering pulmonary function tests (PFTs) or interpreting PFT results; 22.2% and 42.2%, respectively.

	All (n=59)	Practicing (n=45)
Disease state (asthma) education	49 (83.1%)	43 (95.6%)

Device technique counseling	45 (76.3%)	41 (91.1%)
Monitoring response to therapy	40 (67.8%)	37 (82.2%)
Selecting dosage and device formulations	35 (59.3%)	32 (71.1%)
Assessing patients with asthma level of control	33 (55.9%)	32 (71.1%)
Asthma action plan education	32 (54.2%)	31 (68.9%)
Completing asthma action plans	28 (47.5%)	28 (62.2%)
Interpreting pulmonary function tests	21 (35.6%)	19 (42.2%)
Assisting with or administering pulmonary function tests	12 (20.3%)	10 (22.2%)
Other	13 (22.0%)	5 (11.1%)

**Table 2:** Asthma-related activities (% respondents)\*

\*Percentages of respondents do not add to 100% because multiple responses were allowed for these questions.

### Reimbursement

The majority of all respondents (94.7%) indicated the AE-C credential had not improved their ability to apply for reimbursement for asthma-related services. When asked if their organizations received reimbursement for separate or extended patient asthma education in addition to physician reimbursement as part of an office visit (i.e. incident to a provider); 22.2% of the respondents indicated “Yes”; 60.0% “No”; and 17.8% “Do not know”, respectively.

### Reasons for pursuing AE-C certification

Respondents were asked to recall how they first learned about the AE-C credential. The most frequently selected options were “colleague” (40.4%) followed by the “NAECB website” (35%)

Additionally, respondents were asked to identify factors which may have influenced their decision to earn an AE-C. The most frequently selected reasons included: desire to differentiate from colleagues to remain competitive in the clinical arena (64.9%), driven by patient needs (28.1%), and a personal connection to asthma (26.3%) (Table 3). More than a quarter of all respondents (26.3%) selected “other” and manually entered additional influential factors. Most of the manually entered factors related to a personal desire for professional advancement.

### Influence on practice

Respondents were asked how the AE-C had influenced current practice as related to managing patients with asthma. More than 70% either “strongly agreed” or “somewhat agreed” that they were more confident in their ability to assess patients with asthma and monitoring response to therapy, respectively. A similar level of agreement was reported in areas related to professional credibility and confidence in adjusting/recommending therapy (Table 4). When asked whether the AE-C credential had improved credibility among patients, 46.7% remained neutral and neither agreed, nor disagreed.

How did you learn about becoming a Certified Asthma Educator (AE-C®)?*		
	All (n=57)	Practicing (n=45)
Colleague	23 (40.4%)	21 (46.7%)
National Asthma Educator Certification Board (NAECB) Website	20 (35.1%)	17 (37.8%)
As a pharmacy student	3 (5.3%)	1 (2.2%)
Advertisement	2 (3.5%)	1 (2.2%)
Employer	1 (1.8%)	1 (2.2%)
Other	9 (15.8%)	5 (11.1%)
No response	4 (7.%)	4 (8.9%)
What factors influenced your decision to earn an AE-C®? (% respondents*		
	All (n=57)	Practicing (n=45)
Differentiate from colleagues to remain competitive in the clinical arena	37 (64.9%)	28 (62.2%)
Driven by patient needs	16 (28.1%)	14(31.1%)
Personal connection to asthma (i.e. family member with asthma)	15 (26.3%)	12 (26.7%)
Required by employer	5 (8.8%)	5 (11.1%)
Salary increase	1 (1.8%)	1 (2.2%)
Other	15 (26.3%)	11 (24.4%)

**Table 3:** Critical Factors Impacting Certification\*

\*Percentages of respondents do not add to 100% because multiple responses were allowed for these questions.

Area	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Increase credibility among peers and other healthcare professional	16 (35.6%)	14 (31.1%)	11 (24.4%)	0 (0.0%)	3 (6.7%)
More confident in ability to adjust / recommend drug therapy	12 (26.7%)	19 (42.2%)	9 (20.0%)	3 (6.7%)	2 (4.4%)
More confident in ability to assess asthma patients	12 (26.7%)	22 (48.9%)	7 (15.6%)	2 (4.4%)	2 (4.4%)
More confident in ability to monitor response to therapy	11 (24.4%)	22 (48.9%)	7 (15.6%)	3 (6.7%)	2 (4.4%)
Increase credibility among patients	10 (22.2%)	8 (17.8%)	21 (46.7%)	3 (6.7%)	3 (6.7%)
Increase responsibility / expanded scope of practice	8 (17.8%)	19 (42.2%)	13 (28.9%)	1 (2.2%)	4 (8.9%)

**Table 4:** How has the AE-C® credential influenced your current practice as related to managing patients with asthma? (% respondents). Practicing Pharmacists (n=45)

**Professional advancement**

All AE-C pharmacists (n=57) responded to the question about whether the AE-C credential had helped them advance professionally. Accordingly, 22.8% indicated “strongly agree”; 47.4% indicated “somewhat agree”; 21.1% “neither agreed nor disagreed”; and 8.8% either “somewhat” or “strongly” disagreed with this statement (Table 5). Promotion, bonus, added credibility to increase public speaking, and publishing opportunities were common examples of professional advancement listed by respondents.

Since attaining the AE-C certification, I feel this certification has helped advance me professionally (% respondents)		
	All (n=57)	Practicing (n=45)
Strongly agree	13 (22.8%)	11 (24.4%)
Somewhat agree	27 (47.4%)	22 (48.9%)
Neither agree nor disagree	12 (21.1%)	10 (22.2%)
Somewhat disagree	4 (7.0%)	2 (4.4%)
Strongly disagree	1 (1.8%)	0 (0.0%)

Would you recommend obtaining the AE-C® credential to a pharmacist colleague? (% respondents)		
	All (n=57)	Practicing (n=45)
Yes	47 (82.5%)	38 (84.4%)
No	10 (17.5%)	7 (15.6%)
Do you plan to renew your AE-C® certification after it expires?(% respondents)		
	All (n=57)	Practicing (n=45)
Yes	29 (50.9%)	26 (57.8%)
Probably	13 (22.8%)	9 (20.0%)
Unsure	9 (15.8%)	7 (15.6%)
No	6 (10.5%)	3 (6.7%)

**Table 5:** Perceptions and Advocacy of the AE-C

### Certification renewal

The AE-C credential requires renewal every 7 years. At the time of this survey, the only means to achieve renewal was by “retaking” the examination. Respondents were asked about whether they planned to renew their certification. More than half of all respondents (50.9%) had planned to pursue recertification. However, 22.8% indicated “probably”, 15.8% were “unsure”, and 10.5% stated they were not planning to renew their certification. Fifty eight percent of respondents viewed the requirement of having to retake the examination as “discouraging”, while 37.0% indicated they were not influenced either way. Two thirds of respondents (66.7%) indicated that they would be more likely to renew if provided with the option to renew certification via submitting continuing education credits (CEUs).

The majority of respondents (84.4%) indicated that they would recommend obtaining the AE-C credential to a pharmacist colleague. Accordingly, respondents were asked to provide suggestions on how the NAECB may further recruit pharmacists to earn the AE-C credential. The main recommendations for recruiting pharmacists included increased exposure of the credential among pharmacists by advertizing the AE-C through local and state associations, national organizations, pharmacy journals, and schools of pharmacy.

### Discussion

There is limited information related to the roles and responsibilities certified asthma educators are currently fulfilling throughout the United States [6]. There is even less information describing the involvement of pharmacists practicing within these roles. This is the first study that exclusively focuses on pharmacists who have earned the AE-C credential. Those who responded to our survey were most frequently engaged in asthma education, device technique counseling, and monitoring response to therapy. Many patients do not understand the benefits and risks of asthma therapy and often fail to demonstrate appropriate use of inhalation devices. One large observational study found up to 76% of patients made at least one error while using a metered-dose inhaler (MDI) versus 49%-55% with a dry-powder inhaler (DPI) [8]. Numerous studies have shown clinicians may also lack proficiency with using inhaler devices [9-11]. For example, the

Chicago Breathe Project assessed internal medicine residents’ knowledge of hydrofluoroalkane (HFA) inhalers. Of the 119 residents, less than fifty percent were able to correctly identify the necessary steps for properly using an MDI. Additionally, only 59% were confident in their ability to teach inhaler technique [12]. The authors attributed these results at least in part due to the limited training physicians receive on how to use inhaler devices during traditional residency training. Conversely, the Accreditation Council for Pharmacy Education (ACPE) requires pharmacy students to effectively convey medication information to patients and care givers [13]. Proper administration technique for various drug delivery systems, including inhaler devices, is an essential part of the pharmacy curriculum.

Community pharmacies have been recognized as a potential point of care for patients where key concepts related to asthma management may be reinforced [3]. Pharmacists are uniquely positioned to monitor medication refill intervals to help identify patients who may be overusing rescue therapy and/or underutilizing prescribed controller therapy. In an extension of the Asheville Project [14], 207 patients with asthma received services by pharmacists to improve related health outcomes. Patients were followed over a period of 5 years and received asthma education along with extended counseling on medication use, inhaler technique, and trigger management. Pharmacists regularly reviewed personalized asthma action plans and provided a plan to those who had not received one by their physician. After the program, 99% of patients had received an asthma action plan and were six times less likely to have an emergency department visit or hospitalization. These interventions collectively resulted in an estimated total cost savings of \$1955 per patient annually [14]. Similar benefits have also been seen when pharmacists deliver intensive counseling in an inpatient setting [15].

Although a high percentage of AE-C pharmacists monitored response to therapy, relatively few were involved with administering pulmonary functions tests (PFTs) or interpreting PFT results; 22.2% and 42.2%, respectively. PFT is a general term consisting of a variety of standardized measures to assess lung function, with spirometry being the most common PFT. However, we used the term “PFT” interchangeably with spirometry, which may have caused some confusion among respondents.

Relatively fewer AE-C pharmacists who provided direct patient care were involved with selecting dosage and device formulations (71.1%). Though state regulations and institutional policies vary across the country and may not permit pharmacists to participate in such activities. Respondents were also less involved with educating patients about their asthma action plans. Practice guidelines recommend written action plans particularly for patients with moderate to severe asthma, a history of severe exacerbations, or in patients with poorly controlled asthma [3]. Pharmacists have the potential to positively impact this area and should consider working in partnership with patients when reviewing asthma action plans [14].

Moreover, pharmacists must remain current with newly approved asthma therapies, novel delivery devices and updated clinical information. Provider education is an important component to care and multiple studies have demonstrated the need for ongoing multidimensional, interactive clinician education [3]. Although there are multiple “asthma certificate” programs offered by various sources, the NAECB is the only organization in the United States with a nationally recognized and validated certification process [4]. In previous survey results, AE-C health care professionals identified

benefits to becoming certified. These benefits included: Increased credibility, identification as an asthma resource, respect of patient and health care team, and increased personal confidence and trust in their asthma knowledge and expertise [16]. Our results indicated pharmacists chose to sit for the exam to differentiate themselves from colleagues and more than 70% felt as though the certification had helped them advance professionally.

More than one quarter of all pharmacist respondents attributed pursuing this certification due to a family connection to asthma. This personal connection is a potentially valuable attribute that may positively impact important aspects of patient counseling, such as “empathy” and the notion of “sincerity” when personal experiences are shared with patients. Additionally, a fair number of respondents pursued the certification in order to better serve their patients. Although the prevalence of asthma is widespread affecting all ethnic backgrounds, poor asthma control is particularly problematic in patients of low socioeconomic status and among those living in inner-city environments [17,18]. The majority of respondents reported practicing in an urban setting (77.4%), which suggests there may be a particular need for pharmacists with advanced asthma training working within this setting. Only a few stated that it was required by their employer, and even less suggested a salary increase was associated with becoming certified (Table 3).

Despite these benefits, pharmacists comprise less than 5% of all certified asthma educators [4]. Potential barriers to achieving a critical mass of pharmacists obtaining the AE-C credential may include: 1) lack of recognition of the credential among pharmacists, 2) the AE-C is not required to practice, 3) the credential is not required for reimbursement, 4) the cost of the examination, 5) the requirement of having to retake the examination every 7 years to maintain the AE-C credential, and 6) the lack of confidence in passing the AE-C examination. It should be noted that of all healthcare professionals who sit for the examination, as a group, pharmacists have one of the highest pass rates. Lastly, the NAECB recently approved the option of recertification via continuing education credits as an alternative method to renewal.

As pharmacists continue to navigate Medicare Part D reimbursement for medication therapy management (MTM), it is critical that both patient outcomes and costs of pharmacist managed MTM programs continue to be documented [19]. Whether asthma education performed by pharmacists will be reimbursable in the future is unknown. However, the AE-C credential is recognized in many areas of health care and is required for reimbursement by some third-party payers. National standards for providing and documenting quality asthma self-management education are being drafted. If adopted, these standards will hypothetically be the vehicle for asthma education being granted its own Current Procedural Terminology (CPT) code, which will enable further billing and reimbursement for asthma education. It is likely these CPT codes will only be available for use by those healthcare professionals with advanced training in asthma care. Furthermore, managed care organizations (MCO) are encouraged to implement interventions to incorporate AE-Cs into their asthma education programs with the goal of improving asthma care from a population-based viewpoint [6]. MCOs should also support innovative methods that reform the traditional reimbursement system to better align with the ever changing needs of the healthcare system [6].

## Limitations

There are several limitations to the current survey that should be noted. The survey response rate from AE-C pharmacists was 26.3%, which is comparable to rates in similar pharmacist surveys; though, the majority of respondents were currently practicing as an AE-C. While this survey is limited by virtue of its scope and number of responses, it does add to the limited knowledge regarding pharmacists who are certified asthma educators. Additional research is needed to demonstrate and document the value of pharmacist AE-Cs on patients' outcomes and health care costs. Credentialing alone does not guarantee improved patient outcomes and is recognition of competence in a particular area of expertise. Future research could examine the role of pharmacists providing asthma care who have not earned the AE-C certification in comparison to those who have. Our study did not involve a control group and so it is not possible to determine whether differences between these two groups actually exist.

## Conclusion

Pharmacists are uniquely situated within the healthcare team to provide quality asthma self-management education. The AE-C is considered a valuable credential among respondents that increases pharmacist confidence in their ability to assess, educate and manage patients with asthma. To date, few pharmacists have earned an AE-C even though the majority of AE-C pharmacists responding to this survey indicated that they would recommend this credential to their peers. Achievement of appropriate reimbursement for asthma services provided by pharmacists, as well as efforts to increase awareness of the AE-C among pharmacists may result in more pharmacists pursuing the AE-C certification.

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