

## RESEARCH

### The Teaching of History of Pharmacy in U.S. Pharmacy Schools

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One author, Dr. Gregory Higby, wishes to disclose that he is the Executive Director of the American Institute of the History of Pharmacy. All of the other authors state they have no conflicts of interest.

**ABSTRACT**

**Objective.** Determine: how the Standards for pharmacy history were met by U.S. pharmacy schools; whether schools wanted to expand their commitment to pharmacy history; what pedagogical assistance, if any, was desired; and whether elective courses were being offered.

**Methods.** One hundred thirty-three school Deans were asked to identify the responsible faculty for pharmacy history teaching. A ten-question online survey instrument was designed and emailed to them, or the Dean, if no faculty identified. Follow-ups were sent at two week intervals. If non-responsive after three, telephone solicitation was attempted.

**Results.** One hundred schools (75.2%) responded. 53.4% were public and 46.6% were private; with 50.5% having class sizes of 100 or less, 40.8% with 101-250, and 8.7% having over 250. 85.6% meet the ACPE requirement in a required course, with 72.2% devoting one to five hours to it. 68.3% use no supporting literature, and among those who do, there was no common source. However, 21.2% wanted more teaching time, and 91.4% seek pedagogical assistance, varying from a packaged course (26%) to simply a syllabus with assignments and assessment banks (23.1%).

**Conclusion.** Since no time or material guidelines were established to fulfill the ACPE pharmacy history educational requirements, these results provide a starting point to judge what is adequate and/or preferred. With the development of teaching guidelines and adoptable teaching materials, the pedagogical solution to this ACPE standard may become more complete and consistent.

**Keywords:** history of pharmacy; 2016 ACPE Accreditation Standards; pharmacy history teaching guidelines; history teaching; instructional assistance

## **INTRODUCTION**

In 2015 the Accreditation Council for Pharmacy Education (ACPE) released its Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree (Standards 2016).<sup>1</sup> An Appendix to that report described the “Required Elements of the Didactic Doctor of Pharmacy Curriculum.” Among the required elements is “History of Pharmacy” which is described as including topics such as the evolution of pharmacy as a distinct profession, the transition of pharmacy from a product-focused to a patient-focused profession, and major milestones and contributors in the evolution of pharmacy. To provide a basis for making recommendations and offering support as to the best ways to meet this curricular standard, the American Institute of the History of Pharmacy (AIHP) set out to investigate what is currently being done in the accredited colleges and schools of pharmacy in terms of the teaching of the history of pharmacy.

A 1952 publication reported that a survey of the then 70 schools of pharmacy, which had a 100 percent response rate, showed 51% of the respondents indicating they offered a course devoted entirely to the History of Pharmacy, and that in 40% of the schools, it was a required course.<sup>2</sup> In 1995 Buerki reported that despite the best efforts of the AIHP to enhance the teaching of pharmacy history, there had been a steady decline in History of Pharmacy course offerings since 1981 when 39% of pharmacy schools offered a course in History of Pharmacy, and 35% included some mention of the subject in a pharmacy orientation course.<sup>3</sup> Buerki attributed this steady decline to pressures to include new courses dealing with pharmacotherapy and clinical pharmacy topics within the standard pharmacy curriculum. Higby reported that the results of an “unscientific survey” of United States (“U.S.”) pharmacy schools conducted in 2010

indicated that about two-thirds of the schools responding to that 2010 survey included between 1 and 5 hours of instruction dealing with pharmaceutical history inserted into a required course, typically an orientation-type course, and that a quarter of the respondents offered an elective course.<sup>4</sup>

With these past observations in mind, and the publication of the new Standards 2016, the AIHP established a Historical Studies Committee (“Committee”) to investigate what could be done to assist the instruction of pharmacy history and to develop any resources deemed needed. As such, the Committee decided to conduct a study concerning the current status of the teaching of pharmaceutical history in accredited U.S. colleges and schools of pharmacy. The objectives of the study were four-fold. First, to examine how the “required elements” for teaching history of pharmacy were being met by pharmacy colleges and schools. Second, to find out whether the individual colleges and schools desired to expand upon their current commitment to the teaching of pharmacy history. Third, to inquire what pedagogical assistance related to teaching the required pharmacy history might be desired or helpful to the faculty so impacted at the colleges and schools. And finally, to document if any stand-alone elective courses in the history of pharmacy were being offered, in addition to the required history of pharmacy material.

## **METHODS**

An online survey tool (SurveyMonkey™) was used to develop a ten-question online survey on history of pharmacy teaching (see Appendix 1). The survey consisted of five questions concerning the delivery of ACPE-required history of pharmacy content, two questions concerning the offering of any elective course(s) in history of pharmacy, two questions regarding the institutional demographics, and one general comment box for comments, questions or suggestions. The study design was granted exempt status by the Western New England Institutional Review Board.

To improve the validity of the survey results, the Committee determined that it would be best sent to the actual faculty responsible for teaching the required pharmacy history. Accordingly, the pharmacy Deans of the then 133 accredited pharmacy schools were contacted by email and asked to identify the faculty member who had responsibility for history of pharmacy teaching within the curriculum. Those nonresponsive to the initial email request were sent subsequent email requests every two weeks for a total

of three emails. If at that point, there was still no response, the Dean was added to the faculty contact list for the survey.

The survey was conducted between June 2015 and January 2016. The survey was sent by email to the identified faculty member or to the Dean, if no faculty member had been identified. Follow-up emails were sent in two-week intervals when no response was obtained. If no response was obtained after three requests, an attempt was made to contact the Dean's office or the identified faculty member to complete the survey orally via telephone.

Upon completion of the data collection, online survey results were analyzed to determine how the ACPE Standards 2016 history of pharmacy curricular content requirements were being met at the respondent U.S. pharmacy schools. Results were analyzed to determine whether a full course or a part of a course was implicated, the number of didactic hours devoted to teaching history of pharmacy content, and more importantly, the number of didactic hours preferred for such teaching. In addition, survey results were examined to identify whether programs employed common literature or resources for teaching pharmacy history, and which, if any, were most useful, and/or preferred, since such information would be a potential benefit to faculty currently assigned to teach pharmacy history. Finally, the incidences of stand-alone elective courses in the history of pharmacy were noted, as well as the characteristics of such a course, if offered.

## **RESULTS**

Of the 133 U.S. schools of pharmacy contacted, completed surveys were received from 100 schools, yielding an overall response rate of 75.2%. Of schools responding, 53.4% were public schools and 46.6% were private schools. Class sizes for responding schools were: 50.5% with 100 or fewer graduates per year; 40.8% with 101 to 250 graduates per year; and 8.7% with over 250 graduates per year.

Survey results on selected course methodology indicated that 85.6% of schools responding met the ACPE pharmacy history requirement by delivering history of pharmacy content within a required course. When history of pharmacy content was incorporated within a required course, some course titles referenced "health care delivery," "orientation," or other introductory first year (PY-1) courses.

Interestingly, one respondent school believed that incorporating history of pharmacy content in a required course was too superficial to address the content requirement. Only 1.9% of the schools met the requirement through a seminar or similar type program. None of the schools offered a free-standing required course in pharmacy history. The remainder (12 %) indicated they employed a variety of options, including incorporating history of pharmacy topics in multiple required courses as a section or portion of those courses, or having speakers from professional organizations present topics in class meetings, or alternatively, spreading historical topics throughout the curriculum. One school indicated that most of their students take the history of pharmacy elective course. Another school admitted its program is not currently meeting the standard. Finally, one respondent noted that the college was in the process of introducing a new curriculum with a required history of pharmacy course.

In terms of the approximate number of didactic hours devoted to providing the ACPE-required history of pharmacy education, a super-majority (72%) of responding schools indicated that they only spent 1 to 5 hours in that endeavor (See Figure 1). Beyond that, only 6% provided history content at a one-credit level (11 to 15 hours), 2% provided it at a two-credit level (16 to 30 hours), and a mere 1% provided it at a three-credit level (31 to 45 hours). When queried on how many didactic hours of history of pharmacy instruction would be preferred, if given the choice, 21% expressed the desire for more time to be spent on such educational efforts (See Figure 1). Interestingly, none of the schools desired less time for delivering pharmacy history content, and those schools that expressed a desire for more time wanted to double their time commitment, and one school even desired in excess of 45 hours.

With regards to use of literature in the delivery of history content, a majority of the schools responding (62%) reported that no textbook or similar literature was utilized in the provision of the ACPE-required history instruction. Schools that did use textbook or literature resources (38%) either did not specify what was used, or listed a variety of sources. Textbooks cited more than once included: Introduction to Healthcare Delivery: A Primer for Pharmacists by McCarthy and Schafermeyer (5 schools);<sup>5</sup> Kremers and Urdang's History of Pharmacy by Sonnedecker (5 schools);<sup>6</sup> American Pharmacy (1852-2002): A Collection of Historical Essays by Higby and Stroud (3 schools);<sup>7</sup> various older editions

of Remington's The Science and Practice of Pharmacy (3 schools);<sup>8</sup> and Pharmacy Management: Essentials for All Practice Settings by Desselle, Zgarrick and Alston (2 schools).<sup>9</sup>

The survey provided an assorted menu of history of pharmacy instructional materials which AIHP could develop to assist schools in providing the required history of pharmacy content (see Question 5 in Appendix 1), and asked programs to respond as to their respective preferences. As noted in Figure 2, only 9% of respondents indicated that nothing new was needed as materials currently available were reported to be sufficient. In contrast, the remaining 91% expressed an interest in the development of various pedagogical pharmacy history aids, ranging from 26% preferring a complete program of video-recorded lectures, PowerPoint slides, reading materials, assignments, and assessment materials, to 23% merely wanting a sample syllabus with suggested readings and assessments (see Figure 2).

In addition to questioning what schools were currently doing as far as delivery of ACPE required history of pharmacy content, the survey asked if a stand-alone elective course in pharmacy history was offered (see question 6 in Appendix 1). There were 96 responses to this survey question. A super-majority of the respondents (80%) to this survey question indicated that they did not offer such an elective course, while only 20% (18 respondents) did offer such an elective (see Figure 3). The super-majority (72%) of the respondents offering an elective course reported they offered it every year, and 11% reported they offered it twice a year. Seventeen percent (17%) indicated that their history of pharmacy elective was offered only periodically. One respondent noted that the elective was offered every year as long as there was sufficient student interest. Another school offered two different electives in the history of pharmacy, one in the fall semester and the other in the spring semester.

As to these elective courses, there was considerable variation in the extent of offerings, as well as the pedagogical materials employed (see Figure 3). The majority (56%) of courses were two-credit courses; with the remaining courses, either one or three credit offerings. Interestingly, one of the elective courses fulfilled the institution's "writing intensive" requirement. With regard to registration figures, the number of students in these elective courses ranged from 1 to 90, with an average student registration of 27. Finally, only 56% of the elective courses had a required textbook, the most commonly cited one

being Kremers and Urdang's History of Pharmacy.<sup>6</sup> The only other textbooks mentioned by respondents as in use, were: American Pharmacy (1852-2002): a Collection of Historical Essays, and Heroes of Pharmacy: Professional Leadership in Times of Change.<sup>7, 10</sup>

## **DISCUSSION**

Although there are currently no agreed-upon metrics of time allocation, subject areas to cover, or required reference materials to fulfill the ACPE-required curricular elements for history of pharmacy content, the results of this survey provide a starting point from which to judge what is adequate or preferred. There appears to be a desire for more time to be spent on pharmacy history teaching, as well as a desire for some form of pedagogical assistance in the form of instructional materials among the institutions that responded to this survey. The development and availability of updated teaching aids and reference materials will clearly encourage and empower faculty to develop valuable approaches to the teaching of history of pharmacy that should stimulate greater student interest, understanding and enthusiasm for their chosen profession. The results of this survey also demonstrate that there is at least some modest interest among the colleges and schools of pharmacy in the development and offering of free-standing professional elective courses in the history of pharmacy.

In an effort to provide this desired additional guidance and support to faculty who are striving to meet the ACPE standard, and to offer pharmacy students a better historical perspective of their profession, both the AIHP's Historical Studies Committee and the American Association of the Colleges of Pharmacy's History of Pharmacy Special Interest Group ("History of Pharmacy SIG") are hard at work. The Committee has developed "AIHP Guidelines to Meet the ACPE History of Pharmacy Education Accreditation Standard" ("AIHP Guidelines") (see Appendix 2), as well as soon-to-be-released multi-varied pedagogical aids, everything from a la carte modular programming to a simple reference list, to meet the AIHP Guidelines. Likewise, the History of Pharmacy SIG has long published various elective course syllabi, presented helpful programs for teaching pharmacy history, and is now developing elective course packages. It is also worth noting the 2016 publication of a new and concise textbook, A Brief History of Pharmacy, may be another useful reference source for faculty and students.<sup>11</sup>



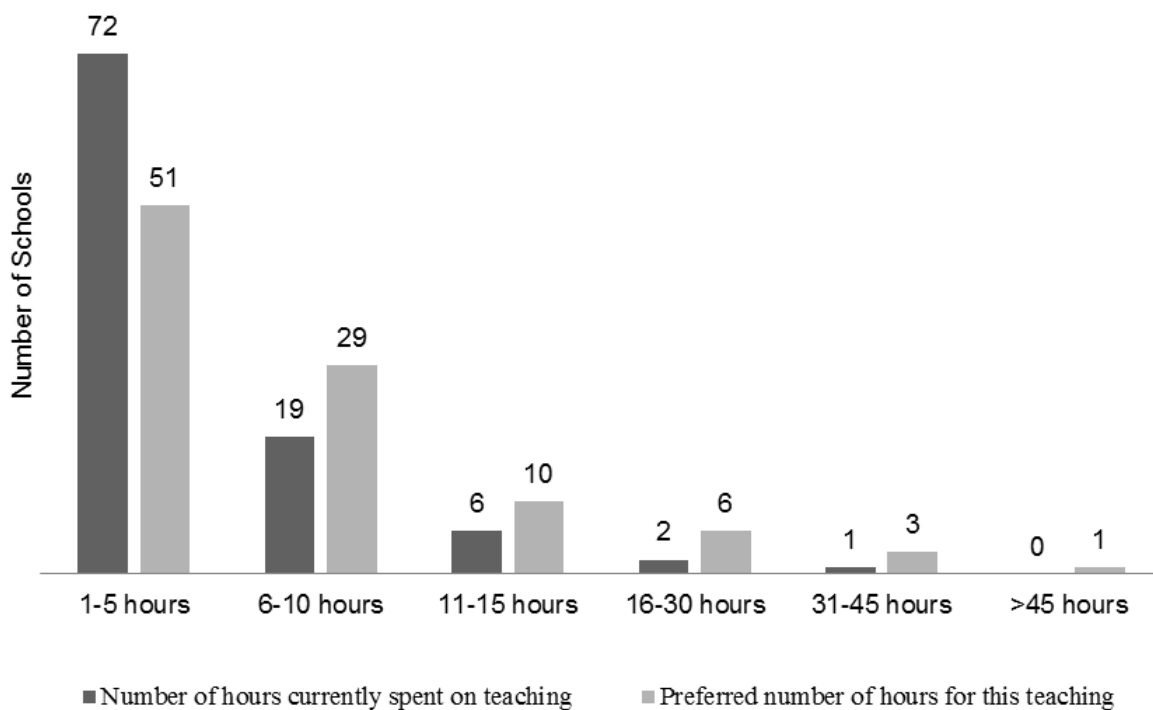
## CONCLUSION

Developing an understanding of the historical development of the profession of pharmacy is a necessary part of the process of professionalization that alone is an important goal, and should be a desired outcome, of any doctor of pharmacy curriculum. As pharmacy students seek to become the ultimate “drug experts” within the modern inter-professional healthcare delivery team, some understanding of the historical evolution of the profession is not simply an educational requirement, it is also professionally relevant. With the development of the “AIHP Guidelines” and the availability of useful teaching materials and references, the successful achievement of this goal of the ACPE 2016 Accreditation Standards and the desire of the academy to provide elective offerings may become more complete and consistent.

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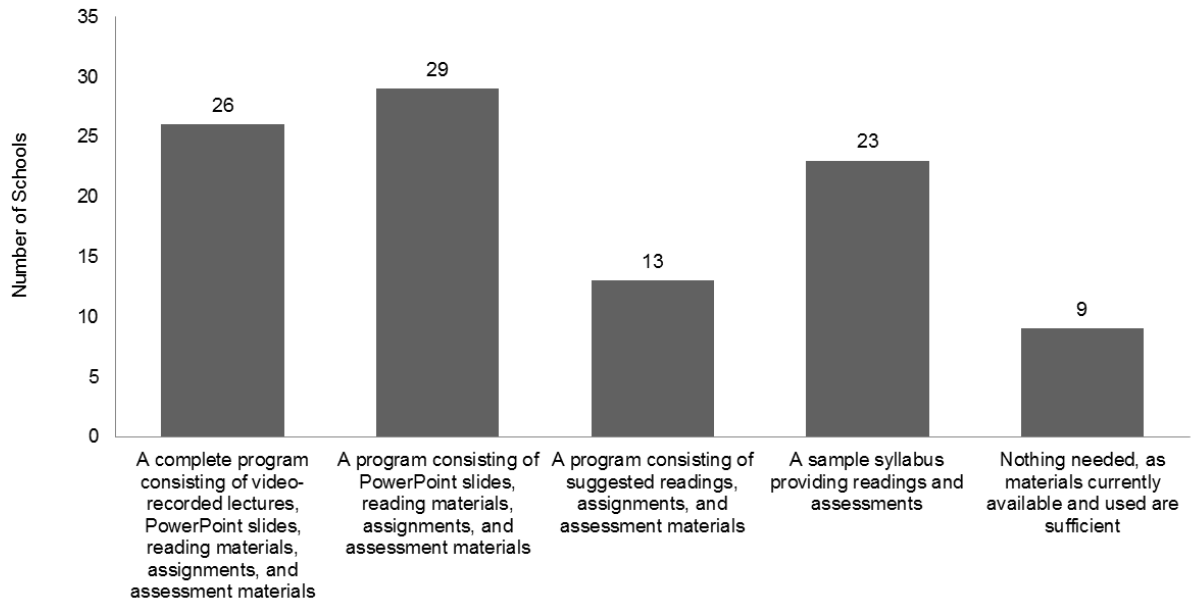
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Figure 1: Didactic hours devoted to ACPE history of pharmacy education vs preferred hours to be devoted to this teaching (n=100)



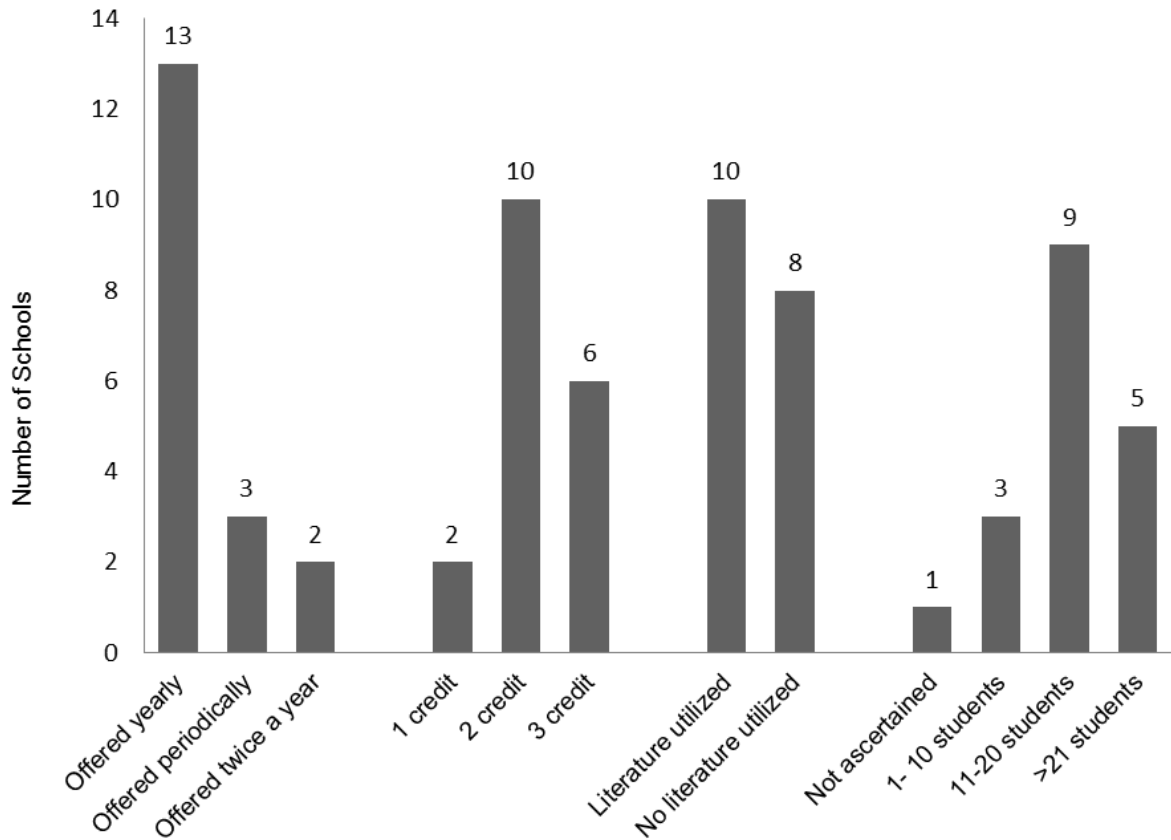
Accepted

Figure 2: Preferred Materials to be Developed to Assist in Providing the Required History of Pharmacy Education (n=100)



Accepted

Figure 3: Stand-Alone Electives in History of Pharmacy Teaching (n=18)



### Appendix 1

#### Survey of History of Pharmacy Education in U.S. Pharmacy Schools

1. Currently the ACPE history of pharmacy accreditation standard is met with a:  
Answer choices
  - separate required course
  - portion of a required course
  - seminar or similar program.
  - Other (please specify)
2. The approximate number of didactic hours devoted to providing ACPE-required history of pharmacy education is:  
Answer choices
  - 1 – 5 hours
  - 6 – 10 hours
  - 11 – 15 hours
  - 16 – 30 hours
  - 31 – 45 hours
  - > 45 hours

3. If you had your choice, how many didactic hours would you prefer to devote to providing the ACPE-required history of pharmacy education?

Answer choices

- 1 – 5 hours
- 6 – 10 hours
- 11 – 15 hours
- 16 – 30 hours
- 31 – 45 hours
- > 45 hours

4. Is any literature or a textbook utilized in the provision of the ACPE-required history of pharmacy education?

Answer choices

- No.
- Yes. Please specify.

5. Which of the following history of pharmacy materials would you prefer to be developed to assist you in providing the required history of pharmacy education?

Answer choices

- A complete program consisting of video-recorded lectures, PowerPoint slides, reading materials, assignments, and assessment materials.
- A program consisting of PowerPoint slides, reading materials, assignments, and assessment materials.
- A program consisting of suggested readings, assignments, and assessment materials.
- A sample syllabus providing suggested readings and assignments.
- Nothing needed, as materials currently available and used are sufficient.

6. In addition to content included in a required course, does your institution offer a stand-alone elective course in history of pharmacy?  
Answer choices
- Yes
  - No
7. Please provide the following information regarding the elective history of pharmacy course offered at your institution:  
Answer choices
- How frequently the elective is offered (*e.g.*, every year)
  - The number of credits for the elective course
  - Required textbook (if none, state so.)
  - Number of students who typically take this elective when offered.
8. What type of institution is your college or school of pharmacy?  
Answer choices
- Yes
  - No
9. Approximately how many students graduate from your Pharm.D. program each year?  
Answer choices
- 100 or less
  - 101 – 250
  - more than 250
10. Thank you for participating in this survey. Your participation is greatly appreciated. If you have any comments or questions for AIHP's Historical Studies Committee, please feel free to write them here.

#### Appendix 2

### **AIHP Guidelines on Teaching History of Pharmacy Education: Meeting "2016 Standards" of the Accreditation Council for Pharmacy Education**

#### **The 2016 ACPE Accreditation Standard:**

From Appendix 1: Required Elements of the Didactic Doctor of Pharmacy Curriculum<sup>1</sup>

Social/Administrative/Behavioral Sciences

History of Pharmacy

Exploration of the evolution of pharmacy as a distinct profession, the transition from a focus on the drug to a focus on the patient and the drug (including pharmacist-provided patient care), and major milestones and contributors in the evolution of pharmacy.

#### **The Goal of the AIHP Guidelines Regarding History of Pharmacy Education:**

To guide and assist the pharmacy academy in the development of pharmacy history education that will meet the 2016 ACPE Accreditation Standard. It is understood that these guidelines can be met in a number of ways, from a distribution of the material throughout the curriculum to a portion of a single course or a stand-alone course.

#### **Recommended History of Pharmacy Content Coverage:**

- A. Introduction to the Study of Pharmacy History
1. Purpose of learning the history of pharmacy

2. Prehistoric and ancient Western therapeutics
3. Non-Western traditional pharmacy and therapeutics (e.g., Ayurveda, Traditional Chinese Medicine, African, Unani, Shamanism)

#### B. Evolution of Pharmacy Practice

1. Separation of pharmacy profession from the medical profession
  - a. Concept of pharmacist arises in Medieval Islamic culture
  - b. Edict of Frederick II, c. 1240
2. Apothecary shop practice in colonial America and the Early Republic
3. 1700 - 1865: In-shop manufacturer of ingredients and preparations
4. 1820: Publication of the first Pharmacopeia of the United States demonstrates prescription writing and filling by meeting the need for drug standardization
5. 1820 - 1940: Pharmacist as compounder of prescriptions/rise of the classic American drugstore
6. 1920 - 1970: Development and growth of hospital pharmacy specialty
7. 1930 - 1965: "Count and pour" dispenser and development of the chain drug industry
8. 1965 - 1990: Clinical pharmacy era and diversification of the profession
9. 1990 - 2005: Pharmaceutical Care era
10. 2005 - Present: Medication Therapy Management and provider status

#### C. Pharmacy Regulation via State and Federal Governance

1. State law impact on the profession and its practice:
  - a. Pre-1870 attempts: primarily involve poison sales, abortifacient restrictions, and discount sales
  - b. 1870-1900: The Model Pharmacy Act and enactment of state pharmacy laws
  - c. 1900-present: Evolution of the pharmacy board, and pharmacy and pharmacist regulation
2. Federal law impact on the profession and its practice:
  - a. 1848-present: Federal efforts concerned for safety in the drug production process and the drugs provided to the public
  - b. 1914-present: Federal efforts to control addictive and abused substances
  - c. 1962-present: Federal efforts to ensure the efficacy of the U.S. drug supply

#### D. Pharmacy Education

1. Prior to 1821: Training through apprenticeship
2. 1821: The beginnings of institutional pharmacy education
3. 1862: The Morrill Land Grants College Act stimulates the development of state universities
4. 1867-1899: State board of pharmacy examinations stimulate diverse educational endeavors
5. 1868: University of Michigan - first science-based state university program
6. 1907-1932: Development of pharmacy education at the B.S. level
7. Development of clerkship and residency training
8. 1960: Establishment of the minimum five-year B.S. degree requirement
9. 1975-2004: Establishment of the minimum Pharm.D. degree requirement

#### E. Growth of the Pharmaceutical Industry

1. Early seeds of the industry--American Revolution: Andrew Craigie, Apothecary General, established first large-scale pharmaceutical manufacturing in the U.S.
2. Post-American Revolutionary period: Philadelphia became the center of the fledgling pharmaceutical industry
3. Mid-19<sup>th</sup> century: Tensions between community pharmacists and industry regarding compounding
4. Early manufacturers: Farr & Kunzi (later named Powers & Weightman), Rosengarten & Sons, Merck & Company, Frederick Stearns, William Warner, Edward Squibb, and many others
5. 1800s: Emergence of patent medicines

6. Early 20<sup>th</sup> century: Emergence of research & development within the pharmaceutical industry; the beginning of pharmaceutical industry associations
7. Research developments from academic-industry collaborations
8. Mid-20<sup>th</sup> century: Rise of the generic pharmaceutical industry
9. Late 20<sup>th</sup> century/early 21<sup>st</sup> century: Globalization, biotechnology, “blockbuster” drugs, horizontal consolidation and vertical integration

#### F. Pharmacy Associations

1. Middle Ages: Pharmacy Guilds form in Europe, and gain governmental recognition and authority
2. 1617: Society of the Apothecaries of London established with continuing overlap of professional roles in Great Britain and colonial America
3. 1821: Formation of the Philadelphia College of Pharmacy by local pharmacists in response to a perceived threat from the University of Pennsylvania in Philadelphia.
4. 1852: American Pharmaceutical Association established as the first national association, with goals of promoting a professional code of ethics and legal standards for drug quality
5. 1898: National Association of Retail Druggists established as the first sub-specialty association of pharmacists
6. 1942: Creation of American Society of Hospital Pharmacists as specialty organization for hospital pharmacists.
7. Latter 20th Century and beyond: Creation of multiple specialty national pharmacy associations, some with local counterparts at the state level.

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**Developed by the Historical Studies Committee of the American Institute of the History of Pharmacy (AIHP); approved by the AIHP Board of Directors, February 2017**