

Curriculum Topics in Pharmacy Education: Current and Ideal Emphasis¹

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This study assessed the current and ideal emphasis for curriculum coverage of 33 generalist curriculum topics in PharmD programs and evaluated barriers to curriculum change. These topics reflect a wide range of recommendations for curriculum change in a number of health professions. This study was part of a larger study of 11 health professions education programs. A 46-item survey using a 5-point scale format was mailed to the curriculum directors at all U.S. pharmacy schools affiliated with the American Association of Colleges of Pharmacy that offer the PharmD degree (n=71). The ordinal scores for current emphasis and ideal emphasis for each of the 33 topics were compared for differences between current and desired emphasis. The ratings of barriers to curriculum change were also analyzed. The four topics rated highest for ideal emphasis by pharmacy respondents were "Effective patient-provider relationships/communication," "Patient teaching/ education," "Outpatient/ ambulatory care," and "Use of electronic information systems." Topics related to community health and health care for the underserved were not ranked highly for ideal emphasis. The most significant barriers to curriculum reform were "Limited availability of clinical learning sites" and "An already crowded curriculum". Responses indicate an awareness by pharmacy curriculum directors of the need for significant improvements in the coverage of broad, generalist competencies in the PharmD curriculum. The curriculum directors were most concerned about increasing the emphasis on "Accountability for cost-effectiveness and patient outcomes," "Health promotion/disease prevention," "Population-based health care," "Managed care," and "Use of electronic information systems." A movement toward primary and outpatient care and better relationships and communication between pharmacists and patients were evident in the curriculum directors' responses.

INTRODUCTION

In the past decade the U.S. health care system has undergone major change, shifting from a professionally-driven fee-for-service model to a market-driven managed care model. Demographic changes, disease patterns, and rapid advances in science and technology have resulted in the use of more drugs and more expensive drug delivery systems. Such changes are challenging those who are responsible for educating the nation's future pharmacy practitioners. Because of the rapid proliferation of pharmaceutical agents, pharmacy has especially felt the impact of these broad system changes.

For nearly a decade, the Pew Health Profession Commission(1-3) has recommended preparing health professions students to be more adaptable and better prepared to work in different environments and within interdisciplinary teams. The Commission's 1993 and 1995 reports(2,3) challenged pharmacy schools to prepare graduates for practice in the changing delivery system by refocusing the curriculum toward such areas as protocol-driven therapies, collaboration with patients and other health team members about drug therapy decisions, counseling patients about their drug therapies, monitoring patient responses to drug therapies, educating the

public about drug-related information, and providing pharmaceutical care in such non-hospital settings as ambulatory care and long-term care. Challenges such as the burgeoning elderly population who often require complicated drug regimens, changes in the organization and financing of health care, demands for cost-effectiveness, the increase in chronic illness, and continuing advances in information systems and pharmaceuticals must be addressed in the pharmacy curriculum as well(3).

The Pew Health Professions Commission's 1993 report(1) recommended the following changes in the pharmacy curriculum: (i) initiate curricular reform that engenders competencies essential to pharmaceutical care (e.g., critical thinking, communication, ethical behavior, teamwork, leadership, and caring); (ii) develop systems of peer review and evaluation that include documentation and review of care delivered, analysis of the outcomes of care, and efforts to ensure the continuing

¹This study was supported in part through a grant from the National Fund for Medical Education through the University of California, San Francisco, Center for the Health Professions. The views expressed in this article do not necessarily represent the views of the supporting organization.

quality and effective coordination of care; (iii) develop and promote a medication-use information system for application to the ambulatory care setting; and (iv) develop a sufficient number and variety of ambulatory clinical training models and sites to provide ample educational opportunity for pharmacy and other health professional students in the delivery of pharmaceutical care. The Commission's 1995 Critical Challenges report(3) suggested that schools of pharmacy "focus professional pharmaceutical training even more on issues of clinical pharmacy, system management, and working with other health care providers."

Traditionally, pharmacy education has focused on drug products, emphasizing chemistry, pharmaceuticals and the control and regulation of drug product delivery systems. The dramatically changing health care delivery system and the increasingly prominent role of pharmaceutical agents in the diagnosis and treatment of disease is shifting this focus to a broader role for pharmacy practitioners. This broader role demands a set of generalist competencies to augment traditional discipline-specific competencies in order to assure that pharmacy practitioners are prepared to practice effectively in the changing environment.

In 1989, the President of the American Association of Colleges of Pharmacy (AACP) formed a Commission to Implement Change. This group re-examined the role of pharmaceutical education in relation to the dramatic changes occurring in society and the health care system(4). Following two years of study, the Commission determined that the bachelor's degree in pharmacy would not longer meet the changing needs of the profession and the health care system. Instead, the Commission agreed that the doctoral degree in pharmacy (Doctor of Pharmacy, or PharmD) should become the entry-level credential for the profession. The program should be at least four academic years in length, with at least two years of pre-pharmacy coursework as a foundation for the upper level professional curriculum. Although the Commission's report did not offer specific recommendations for change, it did provide general direction. The Commission noted that pharmacists of the future would assume greater responsibility for the management of drug therapy in patients. To this end they identified four major areas of competence:

- Conceptual competence - Understanding the theoretical foundations of the profession,
- Technical competence - Ability to perform skills required in the profession,
- Integrative competence - Ability to meld theory and skills in the practice setting, and
- Career marketability - Becoming marketable as a result of education and training.

The Commission also highlighted critical thinking, communication abilities, aesthetic sensitivity, professional ethics, and adaptability as essential skills for future pharmacists(4).

At the same time the Commission was engaged in its work, the American College of Clinical Pharmacy (ACCP) submitted comments to the American Council on Pharmaceutical Education (ACPE) regarding the accreditation standards for pharmacy programs. The ACCP noted, "There will be increasing opportunities and societal mandates for pharmacists to take a more responsible role in managing the therapeutic outcomes of patients. It may be years until these opportunities are realized fully on a national basis. However,

appropriately trained pharmacists can make a meaningful difference in the care of patients. A high priority must be assigned to advancing pharmacy education and training." The concept of the pharmacist sharing responsibility for patients' drug therapy outcomes became known as pharmaceutical care. The pharmacist became responsible for drug dispensing as well as monitoring patients' therapeutic progress, consulting with prescribers and collaborating with other health professionals on behalf of patients.

Our study evaluated the importance accorded by academic deans and curriculum directors (of several health professions educational programs) to 33 curriculum topic areas. Although our survey did not seek to replicate any single report or study, many of the survey topics reflect or are related to the recommendations presented in the Third Strategic Planning Conference for Pharmacy Practice in the 21st century(5). This conference brought practitioners from a wide variety of areas together. A small number of academicians were also invited. During this conference, attendees described pharmacy curricula as being outmoded and unresponsive to pharmacists' needs. Attendees believed that the new PharmD curriculum should emphasize skills such as patient assessment, drug therapy management, and problem-solving.

More recently, the Janus Commission of the AACP called for continuing reform of pharmaceutical education(6). In fact, the Commission suggested that the academic pharmacy community has failed to evolve to meet the current challenges facing the profession. Pharmaceutical education continues to be heavily dominated by a factual, product-based, knowledge-focused curriculum delivered in traditional classroom lectures. The Commission stressed that the ideal curriculum should focus on patient-centered, therapeutic knowledge. Less emphasis should be placed on the pharmacist controlling the supply of the drug product. Instead the pharmacist should coordinate the drug use process in collaboration with other health professionals.

The Janus Commission also recommended that the graduate of a college of pharmacy be capable of solving problems and adapting to changes in health care. The graduate should be able to contribute to positive health care outcomes through effective medication use and be able to collaborate with patients, physicians, nurses and other health care practitioners. The Commission suggested requiring the incorporation of community outreach programs or service learning activities as part of the core curriculum. Clearly this would be a major shift from the emphasis on chemistry and drug products as the cornerstones of the curriculum.

Pharmacy students will not be prepared to meet the demands of these new roles without more extensive and intensive education. In addition to requiring the PharmD degree as the entry-level credential for pharmacy practice, most pharmacy educators advocate that schools and colleges must reconceptualize and reconstruct their curricula so that graduates would be prepared to meet the complex challenge of providing pharmaceutical care. While pharmacy education programs have expanded the curriculum coverage of pharmacy-specific knowledge and skills, it is not clear to what extent they are also preparing their students with the broad competencies and skills needed for practice in an increasingly complex and shifting health care system. In addition to assuring that students acquire the knowledge and skills for the practice of pharmacy, they must also acquire knowledge and skills to practice pharmacy within the broader health care and social environment.

Although pharmacy is a unique discipline, many of the recommendations for the reform of distinct health professions' curricula have described similar skills and competencies as needed by their program graduates. However, the importance accorded to many of these skills and competencies by educators has not typically been evaluated or measured

STUDY PURPOSE

The purpose of this study was to determine the extent to which pharmacy (and ten other health professions) education programs are responding to contemporary calls for educational reform. This study was part of a larger national survey of academic deans, curriculum directors, or program directors of 11 health professions disciplines. The survey measured the extent to which these academic leaders believed that 33 selected curriculum topics are presently emphasized, and the extent to which they believe they should be emphasized in the required curriculum.

The survey was intended to ascertain current and ideal emphasis on selected broad curriculum topics in health professions education programs. The selected topic areas are relevant to a variety of health disciplines; commonalities and differences among the health professions groups surveyed were also of interest.

As a group, the pharmacy curriculum directors were assumed to be familiar with the overall emphasis, coverage, and status accorded the various curriculum topics in their respective programs, and the basic competencies that are expected of their graduates. Thus, they were considered the appropriate target group to survey for the study.

METHODS

A 46-item survey instrument was developed and mailed to the curriculum directors at all U.S. schools of pharmacy affiliated with the American Association of Colleges of Pharmacy (n=71). The names of individuals responsible for curricular affairs were supplied by this organization. This survey was part of a larger study of health professions education, with 1,770 surveys mailed to academic deans, program directors, or curriculum directors in 11 disciplines. In addition to pharmacy, the survey groups included dentistry, undergraduate allopathic medicine, undergraduate osteopathic medicine, nurse practitioner, nurse midwife, and physician assistant, as well as four generalist medical residency programs: internal medicine, family medicine, pediatrics, and obstetrics/gynecology. This paper focuses on the pharmacy program findings, which are also compared with the aggregate responses from the dental, medical, nurse practitioner, nurse midwifery, and physician assistant programs, since these programs are considered to be at comparable educational and practice levels, despite some variations.

QUESTIONNAIRE DEVELOPMENT

The survey consisted of 46 questions in five-point scale format, and one open-ended question, color-coded by survey group. The Total Design Method(7), which uses a booklet format with an illustrated cover, was employed. The survey was developed initially by the research team and revised after conducting a focus group with health professions educational directors representing the groups to be surveyed. The survey was then pilot tested with a group of academic deans and curriculum directors, further revised, and subsequently mailed, with a cover and an assurance of confidentiality. The surveys

were coded for each curriculum director and pharmacy school. After six weeks, a reminder letter and a second copy of the survey were mailed to nonrespondents. Return of a completed survey was considered as the respondent's consent to participate.

In the first section of the survey, the directors were asked to what extent each of the 33 topics: (i) was included in pharmacy students' required learning experiences (current emphasis), and (ii) they believed should be included in pharmacy students' required learning experiences (ideal emphasis). For the 33 topics, respondents also were requested to circle the three topics that they believed "are most important to assure your graduates are prepared adequately for practice in the evolving health care system." In the second section of the survey, respondents were asked to what extent they believed 12 different factors were a barrier to needed curriculum changes in their program. For the 46 scale questions, the five response levels ranged from 1 (Not at All) to 5 (To a Great Extent). The scale contained a clear midpoint; however, the second and fourth levels were not labeled. It was decided that various possible labels were unsatisfactory, and ultimately less intuitively clear than allowing the respondent to infer the level of emphasis.

This survey was not designed to precisely measure the degrees of coverage of any of the topic items. Only general estimates of the current and ideal coverage for each topic were sought. Also, a comprehensive evaluation of the amount of coverage for each item was beyond the resources available for the study. Its principal purposes were to determine which topics the curriculum directors thought needed greater emphasis and to identify those topics with the largest gap between current and ideal levels of coverage, indicating potential areas in which curriculum change may be needed.

The topics selected were diverse and reflected the many calls for health professions education reform across the health professions. The topics were selected on the basis of literature reviews, in-depth interviews with academic deans, and the views elicited in the preliminary focus groups. The final list of 33 curriculum topics reflected the wide range of recommendations for curriculum change that have been made in recent years, including those in pharmacy education(1,3,5,6).

Primary analyses focused on comparisons of the rankings and frequencies of the responses. The current and ideal set of responses from the pharmacy curriculum directors were analyzed with the Wilcoxon Matched Pairs Signed Ranks Test. The pharmacy responses were then compared to the responses of five of the other surveyed groups using the Mann-Whitney Test for ordered data. To aid in interpretation a means was computed for each curriculum topic, using 1 to correspond to a response of "not at all" and using 5 for a response of "to a great extent" with equal interval values assigned to responses in between. The 0.05 level of significance was adjusted for the number of comparisons (Bonferroni method).

RESULTS

Two separate mailings resulted in the return of 51 surveys, a response rate of 72 percent. This compared with an overall study response rate of 55 percent (range 36 to 86 percent). No geographic regions were under-represented in the final sample.

Table I exhibits means (developed from the ordinal scores) for current and ideal emphasis for the 33 curriculum topics. The five topics with the highest ratings for current emphasis were "Effective patient-provider relationships/communication"(3.82), "Patient teaching/education" (3.63), "Tertiary/quaternary care" (3.49), "Outpatient/ambulatory

Table I. Mean ratings of current and ideal emphasis for 33 curriculum topics: Ranked by ideal emphasis

Curriculum topic	Mean	
	Current emphasis	Ideal emphasis
1. Effective patient-provider relationships/communication	3.82	4.62*
2. Patient teaching/education	3.63	4.47*
3. Outpatient/ambulatory care	3.45	4.41*
4. Use of electronic information systems	3.08	4.41*
5. Primary care	3.16	4.36*
6. Care of the elderly	3.26	4.28*
7. Professional values	3.38	4.26*
8. Accountability for cost-effectiveness & patient outcomes	2.66	4.26*
9. Interdisciplinary teamwork	3.08	4.26*
10. Managed care	2.88	4.25*
11. Health promotion/disease prevention	2.76	4.20*
12. Case management	3.02	4.20*
13. Patients as partners in health care	3.02	4.14*
14. Clinical practice guidelines	3.19	4.12*
15. Long-term/chronic illness care	3.18	3.96*
16. Health care economics/financing	2.94	3.92*
17. Understanding & utilizing research findings	3.00	3.88*
18. Home health care	2.63	3.86*
19. Biomedical/health care ethics	3.00	3.80*
20. Continuous quality improvement	2.69	3.80*
21. Health care policy	2.82	3.73*
22. Health care organization & administration	3.14	3.71*
23. Legal aspects of health care	3.43	3.61
24. Business management of practice	2.98	3.56*
25. Epidemiology	2.43	3.45*
26. Psychosocial care	2.57	3.43*
27. Population-based care	2.00	3.38*
28. Community social problems	2.37	3.33*
29. Care for underserved patient/populations	2.33	3.33*
30. Cultural differences	2.22	3.25*
31. Communities as partners in health care	2.12	3.23*
32. Tertiary/quaternary care	3.49	3.16
33. Environmental health	2.00	2.83*

*Difference significant at 0.05 level, Wilcoxon Matched Pairs Signed Ranks Test. Responses were on a five-point scale (1=not at all, 5=to a great extent).

Table II. Topics listed most often by curriculum directors

Curriculum topic	No. times listed	Percent of respondent deans
1. Effective patient-provider relationships/communication	18	51.4
2. Accountability for cost-effectiveness and patient outcomes	13	37.1
3. Primary care	9	25.7
4. Managed care	8	22.9
5. Outpatient/ambulatory care	6	17.1
6. Patient teaching/education	6	17.1
7. Health promotion-disease prevention	5	14.3
8. Professional values	5	14.3
9. Long term/chronic illness care	5	14.3
10. Health care economics/financing	5	14.3

care” (3.45), and “Legal aspects of health care” (3.43). None of the topics was rated higher than 3.82 for current emphasis, and nearly half (16; 48 percent) were rated below the scale midpoint (3.00). The five topics with the highest ratings for ideal emphasis were “Effective patient-provider relationships/communication” (4.62), “Patient teaching/education” (4.47),

Table III. Mean rating of 12 barriers to pharmacy school curriculum changes

Factor	Mean rating ^a
1. Limited availability of clinical learning sites	3.70
2. Already crowded curriculum	3.67
3. Inadequate funding	3.66
4. Professional “turf” issues	3.30
5. Faculty resistance	3.22
6. Lack of faculty expertise	2.76
7. Professional accreditation criteria	2.29
8. Administration resistance	2.29
9. Scheduling conflicts	2.22
10. Student resistance	2.20
11. Professional licensing requirements	2.12
12. Community resistance	1.84

^a Responses were on a five-point scale (1 =not at all, 5=to a great extent).

“Outpatient/ambulatory care” (4.41), “Use of electronic information systems” (4.41), and “Primary care” (4.36). For ideal emphasis, fourteen of the topics were rated above 4.00, and only one—“Environmental health”—was rated below the scale midpoint of 3.00.

Only two of the topics’ ideal emphasis were not significantly different from the current emphasis (at the 0.05 level) using the Wilcoxon Matched Pairs Signed Ranks Test. These

Table IV. Mean ratings and ranking for ideal emphasis: Pharmacy and five health professions academic deans

Curriculum topic	Pharmacy (n=51)		Five health professions (n=289)	
	Mean score	Rank	Mean score	Rank
1. Effective patient-provider relationships/communication	4.62	1	4.58	2
2. Patient teaching/education	4.47	2	4.29	6
3. Outpatient/ambulatory care	4.41	3	4.49	4
4. Use of electronic information systems	4.41	4	4.20	9
5. Primary care	4.36	5	4.54	3
6. Care of the elderly	4.28	6	3.94	19
7. Professional values	4.26	7	4.38	5
8. Accountability for cost-effectiveness & patient outcomes	4.26	8	4.04	17
9. Interdisciplinary teamwork	4.26	9	4.23	8
10. Managed care	4.25	10	3.79	23
11. Health promotion/disease prevention	4.20	11	4.63*	1
12. Case management	4.20	12	3.97	18
13. Patients as partners in health care	4.14	13	4.28	7
14. Clinical practice guidelines	4.12	14	4.05	16
15. Long-term/chronic illness care	3.96	15	3.50	29
16. Health care economics/financing	3.92	16	3.56	27
17. Understanding & utilizing research findings	3.88	17	4.16	10
18. Home health care	3.86	18	3.25*	32
19. Biomedical/health care ethics	3.80	19	4.14	11
20. Continuous quality improvement	3.80	20	3.84	22
21. Health care policy	3.73	21	3.67	26
22. Health care organization & administration	3.71	22	3.48	30
23. Legal aspects of health care	3.61	23	3.71	25
24. Business management of practice	3.56	24	3.39	31
25. Epidemiology	3.45	25	3.87*	21
26. Psychosocial care	3.43	26	4.11*	13
27. Population-based care	3.38	27	3.78	24
28. Community social problems	3.33	28	4.10*	14
29. Care for underserved patient/populations	3.33	29	4.13*	12
30. Cultural differences	3.25	30	4.06*	15
31. Communities as partners in health care	3.23	31	3.91*	20
32. Tertiary/quaternary care	3.16	32	2.97	33
33. Environmental health	2.83	33	3.53*	28

^aThe five health professions or schools are dental, medicine, physician assistant, nurse practitioner, and nurse midwife.

*Difference significant at .05 level, Mann-Whitney Test. Responses were on a five-point scale (1=not at all, 5=to a great extent).

topics were “Legal aspects of health care” and “Tertiary/quaternary care.”

As a group, the pharmacy curriculum directors rated eleven of the topics lower than any other survey group for current emphasis, and six lower for ideal emphasis. However, they also rated two topics—“Managed care” and “Health care economics/financing”—highest among the survey groups for ideal emphasis.

All of the topics except “Tertiary/quaternary care” increased in perceived emphasis from current to ideal. The ratings for sixteen topics increased approximately one full level or more (from current to ideal emphasis), more than any other group surveyed. That is, none of the other surveyed disciplines indicated the need for substantial increases in emphasis for as many curriculum topics as did the pharmacy curriculum directors.

Table II highlights the topics circled most often as most important by the pharmacy curriculum directors as “Most important to assure that your graduates are prepared adequately for practice in the evolving health care system.” The curriculum directors were asked to circle three curriculum topics in response to this statement. The most frequently indicated items were “Effective patient-provider relationships / communication,” “Accountability for cost-effectiveness and patient

outcomes,” and “Primary care.” However, only 35 of the 51 respondents circled items as requested. Therefore, these results may not be representative of the views of the full sample.

The curriculum directors were queried as to what extent each of 12 listed factors would be a barrier to needed curriculum changes. Table III shows the curriculum directors’ ratings of barriers to curriculum change. “Limited availability of clinical learning sites” (3.70), “An already crowded curriculum” (3.67), and “Inadequate funding” (3.66) were considered, on average, the three most significant barriers to curriculum reform. Internal issues—“Professional ‘turf issues,’” “Faculty resistance,” and “Lack of faculty expertise”—were rated next highest as barriers to change.

Table IV compares the ratings of the 33 topic items by the pharmacy curriculum directors and the academic deans or curriculum directors of the five other health professions disciplines that were surveyed. There were 289 responses from these five disciplines (*i.e.*, physician assistant, undergraduate allopathic medicine, dentistry, nurse midwifery, and nurse practitioner). The Mann-Whitney Test indicated that eight topics (Figure 1) were considered significantly more important to the five disciplines (as a group) than the pharmacy educators ($P < 0.05$).

“Home health care” was the only item rated higher in ideal

Ranked Higher by Other Health Professions	Ranked Higher by Pharmacy Educators
Health promotion/ disease prevention	Home health care
Epidemiology	
Cultural differences	
Environmental health	
Community social problems	
Communities as partners in health	
Psychosocial Care	
Care for underserved patients/ populations	

Fig. 1. Topics.

emphasis by the pharmacy curriculum directors (than the five health professions educators) that was also significantly different. However, Table IV reveals a number of other topics with considerable disparity in rank. Considering the relative ranking of the topics, the pharmacy curriculum directors considered "Use of electronic information systems," "Care of the elderly," "Accountability for cost-effectiveness and patient outcomes," "Long-term chronic illness care," and "Managed care" to be more important for coverage than did the comparison group. The latter (in aggregate) ranked "Health promotion/ disease prevention" first in ideal emphasis (4.63), while pharmacists ranked this item somewhat lower at eleventh place (4.20). The other groups also indicated that greater coverage of "Understanding and utilizing research findings," "Community social problems," "Communities as partners in health care," "Care for underserved patients/populations," and "Cultural differences" was needed; considerably less support for these topics was evident in the pharmacy curriculum directors' rankings.

DISCUSSION

Prior to commenting on the key findings of this survey, several survey limitations should be noted. First, while curriculum directors are a key group with considerable influence on and knowledge of curriculum issues, they are not solely responsible for curriculum development. Secondly, in order to enhance compliance, the survey was designed to be brief and easy to complete. Therefore, detailed demographic questions and differences between pharmacy schools were not explored. The curriculum topics included in this survey, in general, do not represent many of the basic science or clinical content areas of pharmacy education. Instead, this survey was intended to evaluate those competencies and curriculum topics that have been consistently identified as critical to the preparation of future health care professionals, irrespective of discipline. Also, even the broad competencies and curriculum topics may vary some from discipline to discipline. For example, "Environmental health" was more relevant to program directors in medicine and nursing, but clearly less relevant to the pharmacy curriculum directors.

This survey focused on the knowledge, skills, and values needed in the education of future health care professionals, and did not attempt to address teaching methods, faculty development, or organizational factors to improve pharmacy education. Despite these limitations, the survey results help broaden our understanding of future directions for pharmacy education

Barriers to Curriculum Change

One of the greatest challenges recognized by pharmacy educators is in the transition from a "passive, classroom/lecture-based approach" to an "active, experiential-based approach" to learning. Limited availability of clinical learning sites is ranked as the greatest barrier. One likely contributor to this is the increased number of clinical rotations in the Doctor of Pharmacy program (typically eight to ten months) compared to the baccalaureate program (typically three to five months). A second contributor may be the need to find sites where the emphasis is on direct patient care activities and patient monitoring, with less emphasis on drug dispensing. For most schools, entry level Doctor of Pharmacy programs are much larger than the post-BS Doctor of Pharmacy program leading to an increased number of students requiring these types of experiences. It is not unusual to find that the number of needed rotation sites has increased from four- to ten-fold. The number of available qualified preceptors, who are willing to take students, is a serious limitation.

The second most commonly cited barrier to change is an already crowded curriculum. Although the entry level Doctor of Pharmacy curriculum has been expanded to four years, most of the additional time has been set aside for experiential learning. The continuing explosion of knowledge and literature regarding new drugs and delivery systems puts a strain on the current time allotted for didactic sessions. In addition, new areas, such as communication skills, information management, pharmacoeconomics, and drug assessment in patient care systems have become important.

The issue of inadequate funding was also considered a major barrier to curriculum change in pharmacy curricula. Many schools have instituted the new curriculum with little additional financial support. The new learning experiences will require small group discussions and experiential training (*i.e.*, smaller student to faculty ratios), and also more computers and classrooms that are equipped with technology to allow distance learning and internet access. It is expensive to transform older classrooms into contemporary classrooms. In many areas of the country, colleges pay preceptors for students doing clerkships and with more clerkships in the curriculum, there is added cost.

Professional "turf issues and faculty resistance are two areas that may overlap to some degree. Some colleges are attempting to integrate basic science courses and clinical therapeutics. This obviously requires time and effort to coordinate different material and possibly different teaching styles into one course. When single instructor courses are changed into courses that are taught by teams, numerous problems often arise.

Curriculum Topic Areas

Some of the recommendations of the Janus Commission noted earlier are obviously supported by the pharmacy curriculum directors. Respondents considered "Effective patient-provider relationships/ communication" and "Patient teaching/education" to be the most important topics for ideal emphasis. "Interdisciplinary teamwork" and "Patients as partners in health care" also received relatively high ratings.

The findings also indicate that curriculum directors who responded to this survey share similar views with participants in the Third Strategic Planning Conference on Pharmacy Practice in the 21st Century with regard to emphasizing needed curriculum improvements. Compared to the other disci-

plines that were surveyed, the pharmacy respondents indicated the need for a greater degree of increased emphasis on nearly half of the study topics. The fact that pharmacy responders to this survey differed from other health professions (in rating more areas in need of a substantial increase) may suggest that pharmacy education has not kept up with other professions in responding to the perceived needs of the health care system and their students. However, another explanation is that since many pharmacy curriculum directors have been involved in comprehensive curriculum change and also in initiating the entry level PharmD program, they have been especially aware of the deficiencies of their programs in their efforts to improve pharmacy education.

Another area that has been cited as being less than adequate in the curricula of many schools of pharmacy is that of technology(8). Very few schools of pharmacy offer courses in medical informatics or information science. Yet given the amount of information available, computer literacy and expertise in searching medical databases and managing large volumes of scientific and patient information are essential in today's workplace. "Use of electronic information systems" was ranked higher for ideal emphasis by the pharmacy educators than by the other surveyed disciplines. This indicates an awareness of the critical importance of information systems to pharmacy practice and an awareness that substantially greater coverage is warranted.

Given that pharmacists are often described as being one of the most accessible health care professionals, it is somewhat surprising that "Community social problems," "Care for underserved patients/populations," "Communities as partners in health care," and "Cultural differences" were not rated higher. Perhaps because pharmacists are often located in drugstores in a variety of communities, academicians may feel that these areas are adequately addressed in the curriculum through community externship experiences. However, less indulgent explanations may be more realistic. Considering all of the items that describe a community orientation or social/cultural consciousness, pharmacy scores were in aggregate lower than any of the other surveyed disciplines. These findings suggest that the Janus Commission's recommendations for increasing community involvement are warranted and may not be realized in the near future. A greater focus on community and population health

issues is often considered a corollary to the growth of health networks or systems. However, this study suggests there is currently a greater separation of pharmacy (compared to many other disciplines) from these emerging systems of care that are so profoundly influencing the practice and education of physicians and other health professionals. The curriculum directors considered "Managed care" to be an important topic. However, a lack of emphasis on broader community and population issues may leave pharmacists at a disadvantage (compared to other health practitioners) as pharmacy is increasingly drawn into the vortex of managed systems of care.

The pharmacy curriculum directors indicated that every item except "Tertiary/quaternary care" was worthy of additional curricular coverage. They also indicated that "An already crowded curriculum" and "Professional 'turf issues'" are major obstacles to needed curriculum change. In spite of this, many pharmacy programs have been successful in restructuring their curricula in recent years. However, for curricula to continue to develop and be responsive to societal changes, honest self-evaluation, as well as concerted efforts, will both be essential.

Am. J. Pharm. Educ., **63**, 145-151(1999) received 6/29/98, accepted 2/15/99.

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