

Roadmap to 2015: Preparing Competent Pharmacists and Pharmacy Faculty for the Future

Combined Report of the 2005-06 Argus Commission and the Academic Affairs, Professional Affairs, and Research and Graduate Affairs Committees

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INTRODUCTION

Annually, the AACP President appoints several standing committees and provides each group with specific charges aimed at priorities for academic pharmacy and AACP. Traditionally the Academic Affairs Committee, Professional Affairs Committee, Research and Graduate Affairs Committee and the Argus Commission issue separate reports and recommendations related to their distinct charges.

As AACP President-elect Beck was considering the areas for committee deliberation in early 2005, the Joint Commission of Pharmacy Practitioners (JCPP) completed a planning exercise that yielded a consensus vision for pharmacy practice in the year 2015. AACP had contributed to the development of the shared vision and the AACP Board of Directors endorsed the document in February 2005. This prompted President-elect Beck to charge each of the 2005-06 AACP Standing Committees with an analysis of specific elements of the JCPP Vision for 2015 seeking recommendations related to the responsibility of academic pharmacy for helping the profession achieve the stated vision.

PROFESSIONWIDE PLANNING FOR PHARMACY'S FUTURE

The JCPP was established in 1977 and serves as a forum for discussion of important issues and priorities of the pharmacy profession. The chief elected officers and chief executive officers of national pharmacy organizations meet quarterly for a full day of discussion and also form working groups of association staff members to work jointly on priority projects.

The profession of pharmacy, in large measure because of the collaboration made possible by JCPP, has an enviable record of planning strategically to determine how individual pharmacists and those organizations that educate, employ, and support them can best use their resources to address societal needs. Beginning in 1984, and continuing at five year intervals up through the present day, leaders in pharmacy have embarked on strategic planning efforts.

The first four planning processes utilized a conference format to examine the environment in which pharmacy services were organized and delivered in all settings. While each meeting was organized differently to meet specific objectives, each conference resulted in a set of recommendations aimed at various groups within and outside the profession. Those recommendations by and large all related to the significant effort that must be undertaken to optimize the medication use process to insure the health and safety of the public; a public increasingly reliant on acute and chronic medication use for the prevention and treatment of health-related problems.

These investments of time and intellectual capital have paid tremendous dividends for society. Collectively, the profession's leaders acknowledged that the focus of pharmacy must move beyond the important but narrow aspect of "right drug to the right patient" and encompass the responsibility for assuring that appropriate outcomes are achieved when medications are part of a patient's individual treatment plan. As a result of this change in the definition of the profession's societal role many other changes have occurred, including the movement to a universal doctoral level of education for entry into the profession. In addition there have been significant practice

and legal changes to expand the scope of pharmacists' services to the public and other professions. The common vision of pharmacists' future practice forged in these planning processes influenced the formation of coalitions among pharmacy organizations and with other stakeholders. These coalitions have been successful at the state and national levels influencing the shape of significant legislative and regulatory changes. The most striking example of this is the inclusion of medication therapy management services as a requirement of the prescription drug benefit being introduced into the Medicare program in 2006.

As the profession's leaders began discussing how to approach planning as 2004 drew closer, they agreed to use a different process than had been used previously. Rather than convening a multi-day conference with a variety of stakeholders, time was set aside at each quarterly meeting of the JCPP for the purpose of working on components of a profession-wide plan. Three groups were formed that worked between meetings to create materials to advance the planning process. These were a writing group, a stakeholders group, and an implementation planning group. The writing group ultimately produced the vision statement now endorsed by all JCPP member organizations. The stakeholders group worked to engage important collaborators in the medication use process in the vision development process. The implementation effort continues today to examine what the drivers of change must be to realize the 2015 vision. The full document is presented as Appendix A.

While the entire vision statement is important for academic pharmacy to study and consider, one portion of the statement specifically describes the outcome of pharmacy education for practice in 2015. It is significant to note that the language parallels the 2004 CAPE Educational Outcomes in the three dimensions of pharmaceutical care, systems management, and public health.

The Foundations of Pharmacy Practice. Pharmacy education will prepare pharmacists to provide patient-centered and population-based care that optimizes medication therapy; to manage health system resources to improve therapeutic outcomes; and to promote health improvement, wellness, and disease prevention. Pharmacists will develop and maintain:

- a commitment to care for, and care about, patients;
- an in-depth knowledge of medications, and the biomedical, pharmaceutical sociobehavioral, and clinical sciences; and
- the ability to apply evidence-based therapeutic principles and guidelines, evolving sciences and emerging technologies, and relevant legal, ethical, social, cultural, economic, and professional issues to contemporary pharmacy practice.

The complete text of the four committees' charges is contained in Appendix B. Though each committee's charge was distinct in focus, the common framework for all the discussions related to the key question of what colleges and schools of pharmacy would need their graduates to be able to contribute to society in light of the JCPP 2015 Envisioned Future. Thus, it was true that the separate discussions seemed to overlap in specific areas and build upon each other. It was decided that a stronger report could be written that began with an elaboration of the fundamental competencies the professional degree programs must produce in pharmacists as scientists, care

providers, and life-long learners and the key environmental analysis contained in the Academic Affairs Committee charges.

The work of the Argus Commission and also the Research and Graduate Affairs Committee examined how the expected outcomes of the professional degree program influence the pre-professional preparation and desired competencies for admission. This provided the backdrop for an examination of the significant pipeline concerns for all scientifically rigorous degree programs related to the weakening of K through 12 education in the United States.

The discussions in both the Academic Affairs Committee and the Research and Graduate Affairs Committee created a bridge related to the preparation of scientists and the faculty of the future. Finally, the expectation of society for accountability regarding the continued competence of both practitioners and faculty at all levels throughout their careers provided the backdrop for the examination of the responsibilities of colleges and schools of pharmacy to prepare lifelong learners and support the continuous development of faculty and alumni.

PRODUCING THE 2015 PHARMACIST IN THE CURRENT HEALTH CARE AND HIGHER EDUCATION ENVIRONMENTS

Since pharmacy education must prepare pharmacists who can optimize medication therapy in the provision of patient-centered and population-based care, consideration must be given to important societal and health care trends or changes that are likely to influence our pharmacy future practice and education needs. Key identified societal and health care trends or changes include the aging of society, greater emphasis on public health, scientific and technological advances, globalization, market forces in health care, increasing accountability, shortages of faculty and academic leaders, and a changing teaching model.

The population is aging as a result of increasing life expectancy at birth with more persons entering old age. It has been estimated that the population aged greater than 65 years will double from the year 2000 to 2030. This translates into an anticipated need for greater patient care provisions in settings such as patient's homes or in skilled nursing, intermediate care, assisted living, and group homes. Thus, a community based practice model will become increasingly important and pharmacy education must prepare pharmacists to provide point of care testing (e.g., blood pressure, cholesterol, diabetes screening) and medication therapy provision and monitoring in these settings, as well as in traditional health care venues. Future pharmacists must also be knowledgeable about geriatric therapeutics, along with how to design, implement, and optimally manage drug distribution systems in these non-traditional settings.

Public or population health issues such as health care quality, medication safety, disease prevention, health promotion, and patient self-care are becoming increasingly important for a variety of reasons. A substantial gap often exists between the best evidence-based practice and what actually happens in the community, with a significant percentage of patients not receiving care commensurate with current scientific evidence.¹ About 80 percent of Americans live in cities or surrounding suburbs, with a prediction that 75 percent of the population worldwide will live in urban areas by 2030. The urban poor suffer from an increased prevalence and severity of the common chronic diseases due to several reasons, including less access to health services.²

Current health care is often fragmented and compartmentalized, with a resulting greater concern about patient safety and medication errors.^{3,4} Consumers are becoming increasingly sophisticated and less tolerant of medical mistakes. With aging also comes a greater need to prevent or minimize the health, quality of life, and cost impacts from chronic diseases and resulting disability. Thus, pharmacy education must focus to a greater extent on public health by preparing pharmacists who can work individually and within systems to improve health care quality and patient safety, evaluate literature and apply evidence-based approaches and care into practice, teach and assist patients to optimize their own care, and promote healthy lifestyles and practices that can help prevent chronic diseases and resulting disability. Pharmacy educators should provide sufficient attention to the populations in their areas and the impact that future urbanization will have on health care in order to prepare students to care for these residents.² Research in the areas of patient safety and quality improvement is critically needed.⁵ Pharmacy education should serve as a resource and catalyst for the conduct of clinical research in the practice community and prepare students to incorporate a "research culture" in their future practices.⁶ Since population health issues and needs necessitate that many common topics and skills be taught across the health care disciplines, this represents an ideal opportunity for collaborative interprofessional practice and research collaborations, as well as curriculum offerings.⁷

Scientific knowledge and technology are constantly changing and improving, with technologies becoming more pervasive throughout society. Pharmacogenetics/genomics will play an increasingly important role in pharmacotherapy by allowing for individualized drug therapy selection that can optimize response and minimize or prevent adverse drug events, (e.g., avoiding postmenopausal estrogen use in women with factor V Leiden or prothrombin G20210A mutations). Drug delivery systems have become more sophisticated, nanotechnology is being applied to the diagnosis, treatment, and prevention of medical conditions (nanomedicine), and new, novel compounds continue to be synthesized. The spread of the Internet and digitalization has resulted in a 24/7 society and one in which distance is not important as an educational barrier.¹ The continued growth of informatics, virtual environments in which patient information and databases are linked among diverse health professionals and settings, wireless technology, and PDAs or other handheld electronic information gathering, storage, or communication devices will profoundly affect pharmacy practice environments. Pharmacy education must prepare graduates who are knowledgeable about emerging scientific advances that will impact all aspects of drugs and drug therapy. Pharmacy education must also teach students to effectively use technology to develop and manage drug distribution systems, to access patient and scientific information, and to optimize patient care provision in a variety of practice settings. A future care model needs to consider how to best move services to the patient rather than having the patient move to the services.⁸ Further, continued innovation is needed by pharmacy education to effectively and efficiently integrate technology into the curriculum to enhance student learning and facilitate self-directed learning.⁹

As technology becomes increasingly sophisticated, the opportunity to interact with others on a worldwide basis occurs without the barrier of distance. This is likely to result in greater diversification and competition for high quality professional and graduate students among educational, including international, institutions. Global health issues will become of increasing concern not only as a result of their potential impact in the United States, but also due to a

growing responsibility to assist others regardless of where they live. Researchers have often not been concerned with the largest health problems on a global scale. Pharmacy education should consider the opportunities to partner with pharmacy programs in other nations for teaching and research, as well as to better prepare students for practice in an increasingly diverse ethnic population.

The expansion of managed care, implementation of medication therapy management (MTM) services, a trend towards higher payments to centers or clinicians that provide higher quality health care, and greater interdependency of the health care disciplines are expected to further impact pharmacy services and education.^{3,5} Unfortunately, there is much ignorance by others outside our discipline about the significant strides forward made by pharmacy.^{4,10,11} Many are not aware of the non-distributive functions of pharmacists and the depth of contributions pharmacy can make to improve patient and health care. Pharmacy education needs to take a lead role in strengthening pharmacy's image and in establishing duties and responsibilities that others will immediately recognize as being in the pharmacist's domain. Students must effectively learn to practice in a rapidly changing managed care environment, to implement, promote and receive reimbursement for a diverse range of MTM services, and to fully function as a valued member of a patient's health care team. Pharmacy education must strengthen its ties with the practice community, develop and evaluate new integrated care delivery models in the community, and lead community based initiatives to ensure that patients receive timely and accurate medical and health information.^{10,12,13} Interprofessional educational experiences should be integrated into the pharmacy curriculum wherever possible to help students learn to value each health profession's unique contributions to patient care and to coordinate patient care.

Accountability is increasingly expected of all institutions, including those in health care and higher education, from the public, government, and accreditation bodies.^{1,2} The public expects high quality health care, and reports of adverse events or other drug misadventures contribute to the call for health care system changes on local and national levels.⁴ Educational institutions have not always helped the situation since applied research or quality improvement projects that could more immediately benefit patients have traditionally been underemphasized in favor of basic research.¹ Further, accreditation organizations require evidence that students graduate with the expected level of knowledge and skills for their discipline. Pharmacy education must deal with both the health care and accreditation accountability issues. As a result, educational, service, and research missions are interdependent and should be in alignment.¹² Clear educational outcomes are needed with an ongoing plan for assessing the achievement of those outcomes and correcting identified deficiencies. Stakeholders, including patients, should be included at every stage of the process, from the development of an integrated vision and mission to the formation of strategic and action groups.¹⁴ Pharmacy education needs to perform greater quality control for its external teaching sites, and partnerships should be forged with those community health systems that provide excellent services and learning opportunities for students.¹⁵ External teaching partners should also be involved in curriculum and course planning and implementation.¹⁶ Increased collaboration should occur between basic and clinical research, more research should be tied closely with patient care, and general practice or primary care research should assume an important role in the research agenda.^{12,17}

Higher education funding has been of concern due to a number of factors, including decreasing revenue streams, continued economic fragility, decreasing state financial support, escalating tuition, escalating technology costs, the expensive operation of academic medical centers, and the inability to cost shift.^{3,9,10,12,18} The future implications of reduced funding include increases in part-time faculty, financial disincentives for individuals to pursue academic careers, faculty leaving academia in favor of higher paying careers in practice or industry, inability to equip and support research facilities, difficulty in acquiring and maintaining the technology needed to enhance and support student learning, the inability to maintain and improve classrooms and other infrastructure, and increasing polarization between the "haves" and "have nots." Pharmacy education should consider innovative or non-traditional sources for funding, as well as ways in which to deliver high quality education in the most cost effective manner.^{10,18} Closer alliances with the private sector, professional organizations, and government agencies should be explored to achieve these goals. Consideration should also be given to shared faculty and courses between institutions, with external partners, and with other disciplines within the university.

A shortage of faculty and higher education leaders is a national phenomenon, particularly in the health sciences, and is projected to worsen over the next several years. Reasons for this are varied and include lack of interest by students in the pursuit of advanced studies and an academic career, financial disincentives and salary differentials between academia and other areas of practice or employment, problems in recruiting and retaining faculty due to real or perceived pressures and conflicts among the research, teaching, and service missions and their associated responsibilities, retirement of current faculty, lack of adequate training and preparation of new faculty to assume academic responsibilities, particularly in the areas of teaching and research, insufficient availability of individuals with suitable education and training in various specialty areas, lack of appropriate mentoring of new faculty, shortages of high quality training opportunities in certain specialty areas, and decreasing available funding opportunities for faculty.^{1,10,19} Inadequate leadership is similarly a problem in higher education. Individuals of the highest caliber should be recruited to assume leadership positions. However, a cycle of faculty shortages leading to the recruitment of less qualified individuals in these positions may result in an even greater future leadership void.¹ These higher education problems are likely to be magnified in pharmacy due to the expansion of available faculty positions and greater competition for existing faculty (full-time, adjunct/experiential preceptors) and administrators. The section entitled "Faculty Resources for the Future" discusses more specifics related to developing the future pharmacy education workforce.

The teaching model has been changing from content-based to one that is learning centered and outcomes-based in order to achieve desired student learning outcomes and fulfill greater accountability and accreditation demands. This can be particularly challenging in an environment in which teaching responsibilities are often undertaken by persons with little training in the discipline, faculty are increasingly pressured to enhance productivity in other areas, many faculty lack pedagogic education, external faculty practitioners often have less time to spend with students, many faculty have diminished interest in teaching due to less developed reward systems for teaching efforts and fewer measures to appropriately assess their impact, faculty who lack sufficient experience with the new technologies they are expected to integrate into the curriculum, and faculty who work in programs without the resources to purchase such technologies.^{1,9,10,20} This is compounded by the need for students to learn an ever expanding body

of knowledge and skills with limited time availability, and by the call for more small group/case-based learning in the context of often increasing class sizes and shortages of sufficiently trained faculty. Pharmacy education must work to change the environment that adversely impacts teaching and learning as much and as rapidly as possible. Implementing a multi-faceted plan to expand the number of available, well-trained faculty is a critical initial step. Careful consideration of faculty workloads and responsibilities in all areas of the academic mission and creation of an equitable reward system for faculty teaching that promotes positive student learning outcomes should also be pursued.

In summary, the key issues and trends occurring in society, health care, and higher education will undoubtedly impact future pharmacy education and the curriculum. Expected areas or topics that will need to be incorporated to an increasing extent in the pharmacy curriculum include:

- Competency in geriatrics and geriatric therapeutics
- Community-based education and training through use of effective community practice models and practitioner-educator relationships and collaborations
- Community-based patient education initiatives
- Designing, implementing, and optimally managing drug distribution systems, medication therapy monitoring, and health promotion activities in non-traditional health care settings
- Palliative care⁹
- Public/population health and health promotion, involving four domains^{7,21}:
 - Evidence Base for Practice—including epidemiology and biostatistics; skills for evaluating and applying the literature to practice; health care outcome measures; health surveillance; social, behavioral, and cultural determinants of health
 - Clinical Preventive Services—Health Promotion—including screening, counseling, immunization, preventive medication and practices, and patient self-care
 - Health Systems and Policy—including organization of clinical and public health systems, methods to optimize care and prevent drug misadventures, health services financing, health workforce discussions and linkages, and understanding of health policy development and key issues
 - Community Aspects of Practice—including communicating health information to the public, environmental health, occupational health, basic concepts and understanding of global health issues, cultural diversity and dimensions of practice, and linkages of health professionals to community preventive services and public health preparedness, including bioterrorism.
- Urban health needs
- Principles of research design, community-based research, and practice-based research
- Implementing, evaluating, and obtaining reimbursement for MTM services
- Developing effective pharmacist-patient relationships, interprofessional relationships, and teamwork skills^{10,21}
- Interprofessional coursework/learning experiences
- Complementary and alternative medicines⁹
- Ethics, humanistic values^{10,21}
- Leadership skills²¹
- Genetics/genomics and other advances and emerging areas in the pharmaceutical sciences (drug delivery, nanomedicine, novel compounds)

- Bioinformatics
- Using technology effectively and efficiently in all areas and aspects of practice¹⁰
- Self-directed learning and lifelong learning skills

ADMISSIONS CONSIDERATIONS/FUTURE PIPELINE ISSUES

Assuring a Strong Pipeline for Pharmacy Education

Despite the upswing in interest in the profession of pharmacy secondary to the well-publicized workforce shortage, a vibrant and engaged pharmacy student body does not arise spontaneously. Rather, it must be visualized and cultivated early on to ensure a proper mix of qualified learners from all U.S. racial, ethnic and cultural populations. Goal VI in the current AACP strategic plan honors this commitment to proactive admission planning by stating that the Association will stimulate recruitment and admission strategies to ensure diverse and competent student bodies for educational programs (professional degree, graduate degree, and postgraduate residencies and fellowships). However, notwithstanding dedicated organizational and individual efforts to nurture informed awareness of the profession, in the current applicant-rich environment, the academy is at risk for overlooking the significance of a number of issues that have the potential to negatively impact the development of a robust and diverse pharmacy education pipeline. If left unaddressed, the four key issues described below will most certainly threaten our ability to optimize the richness of the pharmacy education experience and the future of our profession.

The first key issue is the *status of math and science education in the K through 12 education systems* in the United States. Within the past five years, numerous organizations and commissions representing business, research, education and government have studied and documented the fragile status of US science, technology, engineering and mathematics education.²²⁻²⁶ Repeatedly, such groups report that America's elementary and secondary education systems are failing our children and placing American global competitiveness at risk. This is true despite sustained interest and efforts by many, including the American Association for the Advancement of Science Project 2061, to establish universal science literacy for US citizens.²⁷

The statistics related to the declining performance of US high school students in math and sciences are alarming. For example, the US Department of Education National Center for Education Statistics has reported that, although U.S. fourth graders score well in math and science when evaluated against international competition, they fall near the bottom by the 12th grade.²⁸ According to the report, "Tapping America's Potential: The Education for Innovation Initiative", which described a recent international assessment of math problem-solving skills by 15 year-olds, the US had the smallest percentage of top performers and the largest percentage of low performers when participants from developed countries were compared.²⁹ The report also noted that 70 percent of US middle school students are assigned to teachers who have neither a college major nor certification in mathematics, and science teacher qualifications are similarly dismal across the entire US education spectrum. In all cases, the quality of education in communities with larger numbers of under-represented minority enrollments suffers disproportionately.

The second key issue is the *emergence of strong math, science and technology education programs and employment opportunities* in countries that historically export both students and scientists to the US. The Organization for Economic Cooperation and Development noted in “Education at a Glance: OECD Indicators 2005” that “education is a gateway to employment,” and in almost all OECD countries, educational attainment levels continue to rise.³⁰ It is encouraging that, at 35 percent, the US still leads the world in the percentage of people aged 55-64 who have a college education. With the exception of Canada, no other country has attained a level above 27 percent. However, on the downside, America is now only seventh among OECD nations when the education level of those aged 25-34 is compared. Thirty-nine percent of US citizens in this age range have a college education, a statistic bested by Canada (53%), Japan (52%), South Korea (47%), and the Scandinavian countries (Finland, Norway, and Sweden all at 40%). The same report notes the erosion of American domination of science. One measure of this unwelcome decline is the number of US 25-34 year old university science graduates per 100,000 employed, which currently stands at 1,069 compared to the higher numbers achieved by Finland (2,172), South Korea (2,000), Australia (1,942), Britain (1,926) and France (1,900).

Not all of those who report and reflect on these trends equate the numbers with doom and gloom, noting that higher levels of education anywhere lead to stronger global economies, and that innovations, regardless of their genesis, are quickly employed to the benefit of US and world consumers. That said, leaders in business, education and government collectively voice concern about the ability of the US to sustain the scientific and technological superiority needed to shape the direction of scientific thought and create tomorrow’s innovations. Scarce manpower with the requisite scientific education also challenges efforts to improve math and science education at all levels, including the health professions. The academy has certainly borne witness to the increasing competition between science, engineering, and health disciplines for a shrinking pool of qualified US candidates to fill faculty positions and PhD programs and continues to wrestle with effective strategies to positively address this issue.

The third key issue is the *exponential growth in minority populations* within the US and the differences in educational attainment and career direction between these groups and the majority population. Significant effort has been directed over the last three decades to create racially diverse campuses across the higher education landscape and, from a raw numbers perspective, there is some evidence of success. For example, from 1991-2001 Hispanic, African American and American Indian college enrollment rose 75.1, 36.9 and 35.3 percent, respectively. Yet when the number of underrepresented minority matriculants in a particular racial/ethnic category is divided by the total number of US citizens in that subgroup, a less optimistic picture of educational access emerges. Viewed in this way, it is readily apparent that the enrollment rate for Hispanics (19.9%) and African-Americans (31.3%) is lagging behind the rate for Caucasians (40.9%).

Population dynamics project that the U.S. Hispanic population will continue to grow disproportionately over the next several decades. By 2025, 5.2 million (92.8%) of the anticipated 5.6 million additional school children are projected to be Hispanic. The number of Hispanic students who have completed high school tripled over the past two decades, and this cohort will continue to grow unless unintended consequences of the national testing movement in elementary and secondary education interrupt their progression. The threat of educational

diversion is real, as it has been reported that school personnel are encouraging low-performing students to leave high school in favor of G.E.D. and alternative adult-education programs in the face of pressures to perform on state and national benchmark testing mandated under “No Child Left Behind” legislation.³¹ The impact of this sad state of affairs on the ability of Hispanic and other underrepresented minority students to succeed in the U.S. education system, and ultimately in the workforce, warrants a thorough and honest evaluation with the expectation that identified injustices will be promptly rectified.

In issuing two leadership reports on campus diversity, the American Council on Education notes that enrollment statistics are not as important as measures of success, and has stated that “it does a student little or no good to matriculate if he or she does not succeed, regardless of institution or program.”³² US statistics on graduation rates show that Hispanic and African-American students are less likely to complete a high school education than their White and Asian counterparts. While some would argue that an incomplete education is better than no education, there is concern that the ability of students who leave school prematurely to thrive in an education-centered culture will be severely compromised. This may be particularly true for students who are likely to encounter subtle or overt barriers to success related to their racial, ethnic and/or cultural heritage.

In their fourth paper in the series, “*Increasing the Success of Minority Students in Science and Technology*,” ACE presents data from a longitudinal analysis of persistence toward bachelor’s degrees by race and ethnicity.³³ Interestingly this report affirms that African American and Hispanic students enter degree programs in science and related fields at similar rates compared to their Caucasian and Asian peers. However graduation rates are unequal, with lower percentages of under-represented minorities achieving degrees within six years of starting college.

The report reveals what the critical success factors for all college students are in achieving degrees, regardless of race, ethnicity, or chosen major. The rigor of the high school curriculum is one such factor. Having one parent with a bachelor’s degree is another. Enabling students to maintain consistent, fulltime enrollment, limiting the number of hours worked per week, and providing sufficient grant aid are also identified as success factors for students from all racial and ethnic groups.

The table below summarizes minority enrollments in first degree programs in pharmacy from 1988 to 2004. It is one of many data tables from the student enrollment database which is part of AACP’s Institutional Research data repository.

TABLE 54: SUMMARY OF MINORITY^a ENROLLMENTS IN FIRST PROFESSIONAL DEGREE (BACCALAUREATE, PHARM.D.1) PROGRAMS FALL 1988 TO FALL 2004

Year	Minority Enrollment	Total Enrollment	Percent Minority
1988	3058	28891	10.6%
1989	3160	29560	10.7%
1990	3306	29797	11.1%
1991	3548	30314	11.7%
1992	3524	31519	11.2%
1993	3651	32938	11.1%
1994	3881	33353	11.6%
1995	3849	33415	11.5%
1996	3816	33059	11.5%
1997	3912	32529	12.0%
1998	4074	33090	12.3%
1999	3939	32537	12.1%
2000	4524	34481	13.1%
2001	4908	35885	13.7%
2002	5460	38902	14.0%
2003	5979	43047	13.9%
2004	5685	43908	--- ^b

^a Includes black or African American, Hispanic or Latino, and American Indian or Alaska native students who are U.S. citizens or permanent residents

^b Not able to calculate percent due to change in how data is reported by select institutions

The final key issue relates to *pressures in higher education funding* and their critical impact on all of the preceding realities. Higher education in America has been in a period of financial crisis. State and federal support for higher education institutions and financial aid have been in serious jeopardy for several years, and federal educational access programs of specific interest to the health professions, specifically Title VII initiatives, are currently under siege and expected to suffer greatly under the President’s proposed FY07 budget. As a result of eroding external support, education costs have been shifted dramatically onto the learners, with tuition and fees at public four-year institutions rising 47 percent for the ten-year period ending in 2003-04. These shifts in higher education finances disproportionately impact low-income students and families whose personal incomes only rose 10 percent in this same period of time.

Welcomed evidence that state budgets have become healthier in the last year does not insure that the long history of funding cuts for higher education will be reversed without significant and sustained effort. The rising cost of health care and the need to bolster elementary and secondary education systems often take precedence for many citizens and politicians when given the option to allocate scarce state resources. We must be prepared to advocate for health professions education, and particularly for access to that education by all qualified students, over the long haul.

Proactively addressing the issues. In “Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future,” the National Academies Committee on Prospering in the Global Economy of the 21st Century responded to a request from members of Congress to identify the top ten actions that federal policy makers could take to enhance the science and technology enterprise to allow the US to successfully compete, prosper and be secure in the global community of the 21st century.³⁴ The Committee, comprised of leaders from academia, industry, and government, had a very short timeframe in which to study the available information and make evidence-based recommendations, but concluded that the evidence does suggest that the scientific and technical building blocks of US economic leadership are eroding at

a time when many other nations are gathering strength. They call upon the US to “prepare with great urgency to preserve its strategic and economic security” and urge federal action to advance four recommendations and 20 action steps. The four recommendations are noted below. The detailed action steps may be found in the full online report.

Recommendations from National Academy of Science on US Science Competitiveness

Recommendation A: Increase America’s talent pool by vastly improving K-12 mathematics and science education.

Recommendation B: Sustain and strengthen the nation’s traditional commitment to the long-term basic research that has the potential to be transformational to maintain the flow of new ideas that fuel the economy, provide security, and enhance the quality of life.

Recommendation C: Make the US the most attractive setting in which to study, perform research, and commercialize technologic innovation so that we can develop, recruit, and retain the best and brightest students, scientists, and engineers from within the U.S. and throughout the world.

Recommendation D: Ensure that the US is the premier place in the world to innovate, invest in downstream activities, and create high-paying jobs that are based on innovation by modernizing the patent system, realigning tax policies to encourage innovation, and ensuring affordable broadband access.

What can pharmacy education do? Despite current media attention of pharmacy as a “hot career choice,” the pharmacy education pipeline is clearly as threatened as any other discipline from the forces identified in these national analyses. Academic pharmacy must play a role in local and national initiatives to nurture interest in health and science careers and reach students from both majority and minority populations. It would appear that a two-pronged approach would have merit.

The first focus of pharmacy educators’ contribution would address the core issues of whether students are interested in science and the rigor of such education in middle school and high school. Departments or schools of education on our campuses, and local and state education officials, are potential collaborators for pharmacy faculty whose expertise and creativity might enrich on-going or emerging programs to improve math and science education. There are numerous existing programs and some currently enjoy the involvement of pharmacy and other health sciences faculty, but others do not. AACP could facilitate the sharing of program strategies that have been designed and tested at member colleges and schools. New resources, such as the PBS program “*Pharmacists: Unsung Heroes*,” offer guidance for the introduction of pharmacy as an exciting science-based career for target groups of students.

The second area to strengthen our efforts relates to enabling the success of minority matriculants to colleges and schools of pharmacy. As recommended in the ACE report on increasing success, “the key is for higher education institutions to know how to better identify those students who need support – and what type of support, both academic and financial, would be most helpful.”

Paying attention to work demands/hours, financial needs, and additional support for first generation college students are among the strategies suggested.

PREPARING FOR THE FUTURE IN THE HERE AND NOW

The preceding sections addressed societal factors impacting future health care, advances in science and technology potentially impacting both the content and process of teaching/learning, the present and future higher education environment and its impact on the future pipeline of students for pharmacy practice and pharmaceutical sciences research, and the science and technology education of the next generation of potential pharmacists and pharmaceutical scientists. Certainly, we must always keep our eye on the future lest we be stuck in the past. However, we do live in the present and there are issues confronting both professional and graduate student and pharmacy college/school faculty that are impacting our institutions at this time which need to be addressed. The Research and Graduate Affairs Committee (RGAC) addressed some of these issues and recommended several steps that the association and colleges/schools of pharmacy might take at present to address some of the issues.

Bridging the Cultural Gap between Professional and Graduate Education

Over the past fifty years, there have been a number of changes in the relationship between professional and graduate education in colleges/schools of pharmacy. In the late 1950s through the mid 1970s, there was dramatic growth in both programs, even during the transition from a four to five-year BS professional degree in the mid-1960s.³⁵ A substantial number of the graduate students in the pharmaceutical sciences during this time period, particularly in pharmaceutics and pharmacology/toxicology, were graduates of US pharmacy programs. These graduate students, many of whom were also registered pharmacists, served as laboratory and discussion section teaching assistants. The RGAC discussed the existing AACP policy statement which states that graduate education should not compete with, but should complement, the primary function of colleges/schools of pharmacy, professional education, with the express purpose of determining whether the wording of the policy statement is still appropriate given the changes in the professional degree and the demographics of the graduate student population.

The disappearance of many pharmacy required laboratories combined with the reality that a majority of contemporary graduate students do not have a US pharmacy background has led to a *de facto* separation of professional and graduate students and programs during the 1990s and into the present. Additionally, the diminution of social and professional contact between these two student cohorts may contribute to the lack of interest in academic careers for a large number of pharmaceutical science PhD graduates who view the pharmaceutical industry as their primary employment source. The lack of visible graduate student role models may also be a contributing factor to the dramatic drop in interest of professional students in pursuing a graduate degree in the pharmaceutical sciences.

During the past several years, the opportunity to rebuild a connecting bridge between professional and graduate education in pharmacy has appeared with the National Institutes of Health (NIH) Roadmap.³⁶ The NIH Roadmap was highlighted in the 2004-2005 RGAC Report, “Impact of the NIH Roadmap on the Future of Graduate Education in Colleges and Schools of

Pharmacy.” The 2004-05 report addressed the impact of the Roadmap on research and graduate education, and also discussed its impact on PharmD education.³⁷ In September 2005, following the release of the 2004-05 report at the 2005 AACP Annual Meeting, NIH published a Notice informing institutions of a new program, the Institutional Clinical and Translational Science Award (CTSA), intended to promote and stimulate the education, training, and multi- and interdisciplinary interactions of a new cadre of researchers who will have the capability to more effectively and efficiently “translate” the results of biomedical science research to drugs and products which will positively impact patient health outcomes.³⁸ A potential new “bridge” between professional and graduate education in pharmacy is present in the NIH’s description of translational research.

“Translational research includes two areas of translation. One is the process of applying discoveries generated during research in the laboratory, and in preclinical studies, to the development of trials and studies in humans. The second area of translation concerns research aimed at enhancing the adoption of best practices in the community.”³⁸

The first area of translation describes areas of research carried out by pharmaceutical scientists and graduate students who discover new targets and molecules for drug action, develop new drug delivery systems, new methodologies for measuring and predicting the absorption, distribution, metabolism, excretion, and toxicology of potential drug candidates, perform pharmacokinetics and pharmacodynamic evaluations in animal models, and develop new analytical methodologies prior to the first clinical trials in human subjects. The second area of translational research, research on enhancing the adoption of best practices (evidence-based medicine) in the community, is a goal of graduate education programs in the social, administrative, and pharmacoeconomic sciences and some new “clinical scientist” graduate programs. It is also a goal of our professional degree programs.

The first round of applications for a CTSA or a year-long planning grant was due March 27, 2006 and the first round awardees will be announced in September 2006. A number of Academic Health Centers with pharmacy colleges/schools applied for either a full award or planning grant, and almost without exception, pharmacy faculty played a significant role in the application process as it was universally recognized that the pharmaceutical sciences, by their nature, are inherently translational sciences.

Recommendation: The current policy statement which suggests a hierarchical relationship between professional and graduate education in colleges/schools of pharmacy should be eliminated and replaced with a statement that recognizes the complementary relationship between professional and graduate education. Suggested wording of the new policy statement follows:

Recognizing the importance of translational research in bridging the gap between emerging basic science discoveries and optimal pharmaceutical care, AACP should assume an active leadership role through its meetings and programs in integrating the goals of professional pharmacy education and pharmaceutical sciences graduate

education and research, and to insure a strong future for pharmacy, an active leadership role in promoting graduate education and research.

Faculty Resources for the Future

What will be the composition of the pharmacy faculty in the future? What can institutions do to optimize their faculty composition in view of their specific institutional goals and objectives? What is already occurring in our institutions that portend future faculty composition? The committee discussed a number of factors impacting future faculty resources including:

- The pre-professional curriculum, both length and content.
- The availability of faculty in specific content or skill areas required for the professional and/or graduate curriculum.
- The presence or absence of a graduate program in the pharmaceutical sciences.
- The development of clinical scientist training programs, either post-PharmD or dual degree.
- The continuing development of both distance synchronous and asynchronous teaching/learning methodology for both professional and graduate education.
- The availability of research and graduate students support from federal agencies (e.g., NIH, AHRQ) and private sources such as the pharmaceutical industry.
- Continuing high student demand for a degree in pharmacy.
- Continued attraction of qualified students for graduate study in the pharmaceutical sciences.

The majority of students applying for admission to the professional program in 2004-05 had more than the two-year minimum pre-professional program requirement.³⁵ This has resulted in an “average” incoming professional student with more than the minimum two years of pre-professional education, and often with extensive work experience, commonly in a pharmacy setting. Mandating an expansion of the pre-professional curriculum to either three or four years, which would also involve moving current professional coursework into the pre-professional curriculum, could have a significant impact on the composition of the present pharmacy faculty. Currently, about half of AACP member institutions require microbiology and anatomy/physiology as pre-professional courses, while biochemistry, genetics, and immunology are primarily professional courses.³⁹ If the pre-professional requirement were increased, all these courses may move into the pre-professional curriculum. This would be disadvantageous to students at higher education institutions such as community colleges without faculty resources to provide advanced biological science courses, but it could have advantages if professional programs utilized this more extensive academic pre-professional preparation to increase the flexibility in the required professional curriculum. This flexibility could be utilized to provide more clinical experience throughout the curriculum, provide more students the opportunity to take advantage of research opportunities, and/or dual degree programs such as the PharmD/MS in clinical and pharmaceutical sciences, PharmD/MPH, or the PharmD/PhD. A significant number of students are enrolling in PharmD/MBA programs at those institutions where available.⁴⁰ Alternatively, if more biomedical sciences courses were completed in the pre-professional curriculum, it might not be necessary to maintain a four-year or equivalent professional degree program.

There was consensus in both the RGAC and Argus Commission that before the academy takes an official position on mandating a lengthening of the pre-professional curriculum, objective evidence be obtained that students with more than two years of pre-professional education have better educational and professional outcomes than those with the minimum of two years of pre-professional study. Colleges/schools need assistance in ascertaining whether students who have completed professional course requirements during their pre-professional education are qualified for more curricular flexibility, greater focus on a more clinical orientation to science coursework in the professional curriculum, and opportunities to engage in course work and research experiences in preparation for or concomitant enrollment in a graduate degree program.

Given the increasing numbers of students entering the professional degree program in pharmacy, AACP should explore the possibility of offering two PCAT exams, the basic exam at present, and one advanced exam that would be available for students with three or more years of preprofessional education. The advanced exam could be used to ascertain student's qualifications for admission to college/schools requiring more preprofessional coursework, advanced standing in the professional program, or admission to a dual degree program.

New faculty: curricular content expertise or area of research. In the not too distant past, when an opportunity arose to hire a new faculty person, the most important criterion was the individual's content expertise related to the professional curriculum. Additionally, faculty positions were usually departmentally designated, and departmental rather than college needs often took precedence in the selection process. More recently, colleges/schools have been placing a faculty member's area of research interest and his/her ability to obtain external funding as the prime hiring criterion. Additionally, college/school-wide research priorities and the rise in multi- and interdisciplinary research has contributed to more interdisciplinary search committee structures.⁴¹ However, new faculty hired for their area of research expertise, may or may not have the interest in or the academic preparation to cover a content area of the professional curriculum. In these situations, where does an institution find faculty who can provide needed curriculum content or skill expertise for the professional program?

Increasingly, practice faculty, who have a pharmacy education background are asked to step in to teach content or skills to students because new pharmaceutical sciences faculty do not have a pharmacy education background and are not prepared to provide content or skill instruction that is required in the professional curriculum. Institutions have also identified experienced practitioners who can fill curricular gaps, but unlike the humanities, there is not a large pool of doctoral-level (PharmD or PhD) individuals available to serve as part-time or adjunct faculty to fill in the curricular content gaps. The significant decrease in pharmacy graduates choosing graduate education along with the increase in graduate students with non-pharmacy and/or international education backgrounds has resulted in diminished use of graduate student teaching assistants who can provide significant relevant assistance in classroom and laboratory experiences. This in turn has resulted in a loss of qualified assistance to faculty teaching professional coursework and decreased graduate student exposure to an important component of an academic career.

What other alternatives are there to meet curricular requirements that are not synchronous with faculty interest or expertise? Pharmaceutical industry scientists with “real world” experience are attractive, but their availability for face-to-face instruction is subject to the vagaries of their work schedule or locations too distant from most campuses. They are generally more available for evening or weekend programs, but if face-to-face instruction is desired, then extensive travel may be required. Sharing appointments across university departments can provide needed faculty expertise in some professional or graduate courses without incurring the cost of a full-time faculty member, but shared faculty appointments are not always to the benefit of the faculty member or the institution.⁴¹ If no faculty resources are available, colleges/schools may eliminate curricular content areas and add new areas that are more synchronous with faculty interests. What impact this may have on desired educational outcomes is unknown, but it should not be assumed that the outcome would be negative.

If a curricular content/skill area is needed and no qualified faculty are available to facilitate learning, there is another alternative. With the emergence of electronically connected campuses for pharmacy education, it has become increasingly apparent that a “live” faculty member is not necessary for curricular content to be presented or learning to occur. Synchronous teleconferencing, and combinations of live and digitized faculty content transfer activities (e.g., lectures) have and are being used by a number of institutions, particularly among connected campuses of the same institution.^{42,43,44} Does content delivery in any particular subject area or program have to be made by a faculty member of the institution that enrolls the students?

Content presentation, available live and on demand via DVD, iPod or yet to be introduced electronic technology, can effectively substitute for live lecture presentation. The current generation of students is more comfortable with electronic presentations than those raised on paper-based textbooks and laboratory manuals.^{45,46} Rather than attempting to find an individual with content or skill expertise or retool faculty to provide needed instruction, is it time for colleges/schools of pharmacy pool their resources to provide their students with needed curricular content, both in professional and graduate education? In essence this calls for the creation of a pool of electronic adjunct faculty.

The sharing of faculty expertise among institutions is not new, but it is presently not utilized to any significant degree, perhaps over the concern that the uniqueness of a particular college/school program would be diminished. Moreover, content expertise provided by another institution’s faculty might lessen the argument for increasing the number of faculty members in a program. Intellectual property concerns are not an issue within formal educational consortia, but where formal contracts between institutions do not exist, is the effort worth the cost? What is the role of faculty if they are not preparing and presenting live content transfer sessions?

AACP should charge a committee or task force to explore the opportunities and barriers, including intellectual property and faculty conflict of interest and commitment concerns, of forming regional or national consortia for the production and offering of curricular content via synchronous and asynchronous electronic-mediated methodologies.

The initial reaction to the preceding recommendation might be concern over loss of individual impact or more importantly, institutional uniqueness in their graduates. Certainly, many of us can

provide personal anecdotes regarding how a particular faculty member effectively conveyed an important topic or even a set of values through their lectures or laboratories. However, even if students from different institutions obtained content from one faculty resource, their institution would provide the uniqueness to their educational experience through interaction with their institution's faculty through active learning activities designed to assist students to "understand" what they have heard or seen, to think critically, and solve important problems using the transmitted content. A faculty member does not have to be a content expert to prepare for and participate in activities that make students think critically or to evaluate a student's written or oral presentation of a problem and its potential solutions.

In the area of graduate education, electronically linking campuses together provides an opportunity for graduate students' access to faculty expertise not available at their own institutions, and provides faculty increased enrollments to productively use their time to reach more than just a few students. Electronic classrooms could also be linked with industrial sites to permit more pharmaceutical industry scientists to participate in graduate courses either as students or adjunct faculty members. Pharmaceutical industry scientists also have access to the latest research technology which is often not available in many academic institutions, and they could provide relevant problems to students which would challenge their problem solving skills.

Faculty positions and external funding. One dilemma facing pharmacy programs, particularly those at research-intensive universities heavily invested in graduate education is the question of continued funding for graduate programs where external funding from federal agencies is difficult to obtain. Historically, the costs of graduate education were assumed to a large extent by the university, which waived all or part of the required graduate tuition, and provided graduate student stipends through the granting of teaching assistantships as part of the educational budget. After several years of teaching assistantship support, a graduate student's faculty advisor assumed the stipend support of their graduate student's dissertation research through external sources of research or training grant funds obtained from federal agencies, scholarships/fellowships from non-profit organizations, or unrestricted or contract support from the pharmaceutical industry. Teaching assistantship support has been curtailed on most campuses and is generally available for only one year, and instead of waiving graduate student tuition, the university now expects to be reimbursed from external funds for the cost of graduate student tuition and fringe benefits. These costs, plus provision of a barely adequate living wage for a research assistantship, can exceed \$40,000/year for one graduate student.

The pharmaceutical industry continues to support faculty research, but because project completion is more often on a time deadline focused on a company product, the research is often not appropriate for a graduate student's dissertation work. Therefore, external funding from federal agencies such as NIH, AHRQ, NSF, and the DOD has become the primary source of funding for faculty research and graduate education. This source of funding unfortunately increases and decreases in availability as a function of federal budget concerns and politics, and although NIH funding dramatically increased from 1998-2003, the NIH budget has essentially flattened out since 2003 and both research and training funds are more difficult to obtain, even in those areas of research of high interest to the agencies involved.⁴⁷

There are important areas of research in the pharmaceutical sciences that are not funded to any significant degree by federal agencies. These include the properties and processes associated with transforming active drug molecules into convenient, mass produced drug products, such as tablets, capsules, or other mass produced non-parenteral and parenteral dosage forms. While a myriad of processes involved with drug product development and delivery of macromolecules is presently funded, small molecule drug product development and manufacture receives relatively little federal agency support, which defaults responsibility to the pharmaceutical industry in this area.

Returning to the concept of translational research, the first area “is the process of applying discoveries generated during research in the laboratory, and in preclinical studies, to the development of trials and studies in humans.” If the goal of this first phase of translational research is development of trials and studies in humans, then a dosage form or delivery system must be available for the trials which can be scaled up, with the same stability and bioavailability as the clinical trial delivery system, to provide the drug therapy for considerably larger numbers of individuals if the clinical trials are to proceed to an New Drug Application (NDA) to the Food and Drug Administration (FDA). Unless faculty members whose research focus is drug development and manufacturing can obtain federal agency support or unrestricted support for graduate student stipends and research, there is imminent danger that this historically important area of pharmaceutical sciences will disappear from pharmacy colleges/schools, as the university cannot or will not directly support graduate education. If graduate programs in this area disappear, it will just be a matter of time before the unique understanding of drug products disappears from the pharmacy curriculum.

While areas such as drug product development and manufacturing face an uncertain future due to the paucity of external federal funding, academic pharmacy also suffers from a lack of qualified faculty in an area of growing importance and federal support, clinical research. Clinical and translational research is often used interchangeably, but according to the NIH, they are different. Clinical research is defined as research involving human subjects, while translational research deals with research up to the first trials of a drug product in human subjects and the translation of the finding of clinical research to patient care. Clinical research partially overlaps with translational research, but can be thought of as Phase I, II, or III research leading up to the submission of a NDA, or Phase IV research designed to better utilize the drug for FDA label-approved conditions. Studies designed to investigate an approved drug for a non-approved use also constitute clinical research.

The similarities and differences in education and training of clinical and translational researchers in pharmacy and the pharmaceutical sciences is best left for another committee, but it can be agreed that academic pharmacy suffers from a lack of clinical researchers, that is, faculty members who primarily conduct important human subjects research. Clinical research is more collaborative by nature than other forms of research, which has worked against the recognition and advancement of clinical researchers in academia, including medicine.⁴⁸ This “lack of respect and recognition” was made clear during the NIH-sponsored workshop that lead to the requirement of a separate Center/Department/Institute home for clinical and translational research in the Institutional Clinical and Translational Science Award (CTSA) program.⁴⁹

It is impossible to imagine a clinical study without a team of health care professionals including at minimum, a physician primarily responsible for the safety of the subjects, a nurse or nurses monitoring clinical parameters in the study subjects, clinical and other laboratory personnel measuring a plethora of biochemical, radiological, or functional clinical biomarkers, statisticians assisting in study design and analysis, and the clinical researcher(s) responsible for envisioning, designing, and monitoring the research study. This team approach to clinical research along with the often achieved lack of definitive results common to comparative clinical trials is often viewed with skepticism by the predominant “independent” and reductionist science research culture when it comes time for promotion and tenure evaluations. Yet the long-term advancement of academic pharmacy is dependent upon the success of building and developing a large and competent cadre of clinical researchers both for its future faculty and the pharmaceutical industry.

One major issue facing the academy in developing professional program students into competent clinical researchers is the vigorous clinical research environment required for education and training. Although important clinical research must and can be done in a community setting, the education and training of clinical researchers needs significant interaction with patient populations that are often only available in Academic Health Centers. Not all pharmacy programs are either part of or closely affiliated with an Academic Health Center or similarly research focused medical center. Didactic instruction in clinical research methodology, regulatory and ethical considerations of dealing with human subjects, advanced pharmacokinetics and statistics can be taught at any and every college, either with local faculty or through synchronous or asynchronous distance education methodologies. But providing students with an active clinical research environment may require translocation to another college/school associated with an Academic Health Center. Again, this will require collaboration among institutions to provide the maximum number of interested and qualified professional degree students the opportunity to develop into clinical scientists.

Acculturating Graduate Students and New Faculty to the Profession of Pharmacy

As stated previously, a majority of pharmaceutical sciences graduate students no longer possess a professional degree from a US college/school of pharmacy.⁵⁵ Other AACP committees have addressed this “disconnect” between academic backgrounds of new faculty and the culture of the professional degree program and the practice of pharmacy.^{50,51,52} This is not to imply that pharmacy faculty without a pharmacy degree program cannot or are not supportive of the objectives of the professional degree program or cannot or are not effective in their instructional roles and responsibilities, but the lack of a professional degree in pharmacy places an additional burden of time and effort on these faculty if they wish to become familiar with pharmacy practice. A number of suggestions have been forwarded to assist new faculty without a pharmacy background, but what is most important is that whatever effort is undertaken it must be more than a short “orientation” process.

Several colleges/schools have instituted formal faculty development or “mentoring” programs for new pharmacy faculty members.⁵³ These mentoring programs have traditionally focused on assisting new faculty with their research, while others have components dealing with

acculturating new faculty to the profession of pharmacy. Faculty mentoring programs are the responsibility of each institution, but it appears that each operates without the benefit of sharing information on what works and what does not work, particularly in assisting new faculty to understand the profession of pharmacy. AACP should develop and offer a train-the-trainer program for department chairs and other faculty who have taken a major role in mentoring new faculty in the pharmaceutical sciences, including methods to acculturate these faculty to the profession and the professional curriculum.

Graduate students in the pharmaceutical sciences have additional opportunities to discover the profession of pharmacy through designed interactions with professional students. Inasmuch as a majority of professional students are entering their program with as much higher education background as entering graduate students, the educational hierarchy of graduate student-pharmacy student no longer exists, but has been replaced by an educational peer-peer relationship. Graduate students and professional students can learn from each other, as each pursues a different focus in their educational programs. Several examples of introducing graduate students to the clinical environment as a potential activity for developing interdisciplinary scientists were outlined in the RGAC 2004-05 report.³⁷ One of the programs described in the report, the Howard Hughes Medical Institute's (HHMI) Med into Grad Initiative Integrating Medical Knowledge into Graduate Education, was proposed as a possible model for graduate programs in the pharmaceutical sciences. HHMI announced the initial awardees in February 2006, and a brief description of their programs outlines a number of activities that could be easily achieved in our colleges/schools of pharmacy, such as having graduate students on clinical rotations, participating in pharmacotherapy case presentations, and identifying clinical faculty co-mentors.⁵⁴

Graduate programs in the pharmaceutical sciences should engage graduate and professional students in common learning activities, including the classroom, research laboratory, and pharmacy practice environments for the purposes of acculturating graduate students to the profession of pharmacy and pharmacy students to research.

Faculty Participation in the Education of Professional and Graduate Students

Although there were opinions that professional and graduate education programs have distinct goals, a consensus developed among RGAC members supporting the importance of faculty scholarship, whether both programs existed in an institution or not. At those institutions with significant graduate education programs, there was some disagreement over the question of whether all faculty members, particularly those with vigorous research and graduate education programs should be required to teach in the professional degree program. Some RGAC members did not think all research faculty needed to instruct professional students, while an alternative view was that it was difficult to argue for the value of a scholarly faculty in a professional program if the faculty most involved in research never interacted with the professional students. For example, does the presence of outstanding faculty researchers in an institution which educates professional students add value to educational environment if they never interact with the students in a classroom setting? Some members thought that even if faculty did not teach professional students, they could have a positive impact on the program if the students were knowledgeable about the faculty member's research and some of the students worked with the

faculty member and his/her graduate students on a research project. Alternatively, completely isolating research faculty from professional students (and future alumni) may not be in the best interest of the institution, particularly when there are fewer pharmacy students pursuing graduate education than anytime in the recent past.

This issue could not be resolved by the RGAC, although it does address an issue that is not uncommon at research-intensive universities where numbers of well-funded faculty with significant research programs, multiple graduate students and postdoctoral fellows have at best, very little interaction with professional students. In some disciplines this has resulted in a large proportion of classes being taught by adjunct faculty or graduate students, fortunately, a situation not common in colleges/schools of pharmacy. However, it is possible that the majority of all didactic and experiential teaching could default to the clinical faculty, if attention is not paid to ensuring that pharmaceutical sciences faculty members play an active role in teaching/learning in the professional education program.

ASSURING COMPETENCE ACROSS THE LIFESPAN

The Academy's Agenda for Continuous Professional Development

The Joint Commission of Pharmacy Practitioners (JCPP) "Future Vision of Pharmacy Practice in 2015" statement clearly articulates a future vision for pharmacy and how pharmacy practice will benefit society. The "Foundations of Pharmacy Practice" section of the vision statement not only addresses pharmacy education's role in preparation of pharmacists for this envisioned future, but asserts that pharmacists will *maintain* their social commitment to patients and their in-depth knowledge, skills and abilities appropriate to contemporary pharmacy practice. Pharmacists are described as "valued patient care providers whom health care systems and payers recognize as having responsibility for assuring the desired outcomes of medication use." (Appendix A)

AACP is positioned to identify the role for the academy in supporting a transition to a model of continuous professional development for continued competence of practitioners. A recommendation of the 1994-95 AACP Professional Affairs Committee urged colleges and schools of pharmacy to replace existing approaches to "continuing pharmacy education" with a system of career-long "continuing competency contracts" with local/regional practitioners, alumni, and others wishing to affiliate with such a program. The Committee stipulated that these programs should be educationally sound in design with processes and outcomes to assess and provide knowledge and skills that are essential to contemporary competence in pharmaceutical care practice.⁵⁵ In 2003 the AACP House of Delegates adopted the policy statement "AACP should support the concept of Continuous Professional Development" recommended by the Continuing Pharmacy Education Section of the Association.⁵⁶ By leading the profession in developing an agenda for improving the lifelong learning of our graduates, AACP can have an important role in promoting excellence in pharmacy practice in the future.

Concern about practitioner competence has existed longer than the development of structured health care education; indeed, it was this concern that led to development of such educational programs and eventual introduction of a mandatory licensing examination for health care

practitioners. In 1975, concern over continuing competence led an American Association of Colleges of Pharmacy (AACP) and (then named) American Pharmaceutical Association (APhA) joint task force to recommend that continuing education be required for pharmacist relicensure.⁵⁷

Continuous professional development (CPD) is defined by the International Pharmaceutical Federation (FIP) as *the responsibility of individual pharmacists for systematic maintenance, development and broadening of knowledge, skills and attitudes, to ensure continuing competence as a profession, throughout their careers.*⁵⁸ Paraphrased by one expert, CPD is “a reason to learn; a way to learn.” To guide the state-based CPD pilots (Indiana, Iowa, North Carolina, Washington, Wisconsin), the pilot task force adopted this definition in May 2006: Continuing Professional Development (CPD) is a self-directed, ongoing, systematic and outcomes-focused approach to learning and professional development. *Pharmacists who adopt a CPD approach accept the responsibility to fully engage in and document their learning through reflecting on their practice, assessing and identifying professional learning needs and opportunities, developing and implementing a personal learning plan, and evaluating their learning outcomes with the goal of enhancing the knowledge, skills, attitudes and values required for their pharmacy practice* (E-mail communication from Cindi Koh-Knox, May 24, 2006). The goal of CPD is to ensure competency in practice and to ensure that pharmacists, throughout their careers, evolve their practices so they can provide the best care possible to patients and communities. The desired outcomes of CPD include improvement in individual patient health outcomes, demonstration of practice competence in specific settings, professional development, attainment of organizational outcomes, improvement in public health outcomes, and improvement in the quality, rather than quantity, of learning. Defining elements of CPD include self-directed, ongoing, structured and systematic learning; outcome-focused development of knowledge, skills and attitudes; and assurance of professional competence. The CPD cycle includes five educational steps: *reflect, plan, act, evaluate, document.*

The concept of CPD is not new. It began in the 1990s as a consequence of applying continuous quality improvement processes to health care practice. Health care consumers have been an important driver in the push toward continued demonstration of health care practitioner competence.⁵⁹ The most dramatic example occurred in the province of Ontario, Canada, in 1991, when legislators passed the Regulated Health Professions Act.⁶⁰ This legislative act required regulatory bodies for each of the health care professions to evaluate on a continuous basis the competence of the practitioners over which that regulatory body had jurisdiction. The fact that Ontario demanded proof of competence not just from physicians or pharmacists, but from all licensed health care practitioners, exemplifies how CPD is essentially considered as one tool to fix broken processes within health care systems that compromise patient safety and quality of care.

One of the earliest iterations of CPD was development of learning contracts, which evolved as a tool to facilitate student self-directed learning. Learning contracts are agreements between educators and students that specify for any given learning experience the learning objectives, needed resources and strategies for accomplishing the learning, and specific criteria (and evidence) used to evaluate learning experience outcomes.⁶¹ Learning contracts were used successfully in 1993-4 by pharmacy students at the University of Wyoming School of Pharmacy in a pharmacy communications course, although students indicated discomfort with the idea of

using learning contracts in a primarily fact-based didactic learning environment.⁶² Several of the elements of contract learning are also core elements of CPD.

In 1995, and again in 1997, the Pew Health Professions Commission Taskforce on Health Care Workforce Regulation issued ten recommendations, several of which touched on some aspect of practitioner competence.^{63,64} In particular, recommendation 7 stipulated that states should assure the continuing competence of regulated health care professionals.

The concept of health care competency assessment picked up speed when in 1996, the Institute of Medicine launched an initiative to improve overall health care quality and increase patient safety in the United States.⁶⁵ Pursuant to that goal were recommendations for improvements in health care professional education, including post-graduate education. Specific recommendations emerged from a summit conference of health care educators, regulators, and other stakeholders, held in June 2002. Leaders from pharmacy education and pharmacy associations were members of the planning committee, participated in the summit itself, and had input into the final report, which contained ten major recommendations for health care education reform.⁶⁶ Recommendations 4 and 5 were particularly pertinent to CPD, as they advocated periodic, post-graduation measurement of practice competence for all health care professions in the US.

Practice competence has been defined by the Accreditation Council for Graduate Medical Education as the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and the community being served.⁶⁷ Competence has been defined by the Accrediting Council for Pharmacy Education as knowledge, skills, attitudes, and abilities; this statement also acknowledges the importance of post-graduate education in retaining, as well as attaining, competency.⁶⁸ There is a surprising paucity of literature defining specific knowledge, skills, and attitudes that constitute a “competent” pharmacy practitioner.

CPD Models

Several models of CPD in pharmacy exist. A model emphasizing competency testing was launched in 1996 in Ontario, Canada.⁶⁰ The Ontario College of Pharmacists (a regulatory body analogous to a US state board of pharmacy) annually reviews learning portfolios from one-fifth of all provincial direct patient care pharmacists; all patient-care pharmacist portfolios are thus reviewed within a five-year cycle. Each year, 200 pharmacists are randomly selected from the pool of pharmacists presenting portfolios that year. These pharmacists must complete a written test (knowledge) and a practical competency demonstration (skills), and participate in small-group peer review of the learning process (attitudes). Ontario’s model is the only currently existing model which has uncoupled the professional portfolio from the competency testing process.

The United Kingdom (UK) launched in 2002 and completed in January 2005 roll-out of a mandatory CPD program for all practicing pharmacists.⁶⁹⁻⁷¹ This program is portfolio-based, with all pharmacists required to design, implement, and document their professional learning activities. Portfolios will be reviewed by the national licensing body every three to five years. Two interesting aspects of this model are the centralization of information made available to

pharmacists about CPD (www.uptodate.org.uk) and the aggressive “marketing” drive by the Royal Pharmaceutical Society to explain and promote CPD. This marketing has included multiple “how to” publications, regional meetings to explain the process and address concerns, and frequent publications highlighting descriptions of CPD projects completed by individual pharmacists.

In 2003, New Zealand legislators passed the Health Practitioners Competence Assurance Act, requiring health care professionals to demonstrate competency in order to retain licensure. Proof of competency will become mandatory for New Zealand pharmacists in 2006. CPD demonstration appears to be portfolio-based. The only (as-yet) approved program includes a process for pharmacists to self-identify areas for growth, and an electronic “folder” where plan development, initiation, and outcome can be documented.⁷²

The Alberta College of Pharmacists has recently completed a pilot project for a CPD process that went province-wide in autumn, 2005.⁷³ This program is somewhat unique in the development and use of a 100-page web-based inventory, which enables a pharmacist to self-assess competency, determine areas of desired growth, develop a plan, and document outcomes of the learning process. Although the size of the inventory was initially daunting to most of the pilot study participants, they reported that navigation through the inventory became easier as they gained familiarity with it.

In the US, some states are designing pilot CPD programs, under the direction of ACPE and in partnership with state pharmacy associations through the National Council of State Pharmacy Association Executives (NCSPA). The pharmacy community as a whole, however, lacks a clearly defined response to the concept of CPD. This is due, in part, to the autonomy of state regulatory agencies: laws governing pharmacy practice vary markedly between states, and some states may favor linking CPD to licensure, while others do not. The ongoing pharmacist shortage has also delayed attention to practice competence. As payers and health care consumers increasingly demand evidence of treatment effectiveness, however, they will also want proof of competence from the people who provide that treatment.

Inculcating the Skills and Attitudes for CPD in Learners/Faculty

AACP and the colleges/schools of pharmacy have an important role in the development and implementation of practitioner continuous professional development. Many colleges and schools state that part of their mission is to prepare students to become life-long learners. CPD is a structured process allowing students to design, implement, and evaluate learning; it is likely that students who become familiar with this process during school are more likely to continue it once they leave school. CPD also can provide a way for colleges and schools to measure learning outcomes. Faculty members and preceptors can and should develop their own formalized plan for continuous learning, not only for their own professional growth, but to act as positive role models for their students. Finally, many colleges and schools providing post-graduate education for alumni and other area pharmacists may institute a formal CPD process for their constituents. AACP can provide guidance to members in these development efforts.

There are many reasons for starting the CPD process prior to pharmacy degree program completion. Colleges and schools are responsible for initiation of professional learning and provide an ideal environment to teach learning skills that can be used after graduation. Students who practice systematic competency and learning needs assessment, development and initiation of learning plans, self-evaluation of learning, and documentation of reflective thinking while in school will be much more comfortable with continuing the process once they become practitioners. Coursework in professionalism, practice advancement, and system change (all important components of CPD) may stimulate application of these processes by students during and subsequent to their pharmacy school education. The reflection process facilitates recognition of professional growth and development of new skills as these occur, and identification of where these skills can best be applied. Additionally, many pharmacy programs use multiple learning formats for teaching a variety of subjects and can instruct students in effective use of each learning format as well as provide students with the opportunity to practice using each format. Finally, students familiar with the CPD process can be a process resource to their practitioner preceptors, once that process is initiated in the practice community.

Pharmacy colleges/schools may also be semi-controllable environments for piloting new features of CPD programs, before bringing them to the pharmacy community at large. Consistent access to a cohort of learners can facilitate research into various aspects of CPD.

AACP can assist colleges/schools of pharmacy to implement CPD by encouraging college/school development of a CPD program that begins early in the pharmacy school experience. Many institutions already have a portfolio process or similar infrastructure in place, which will facilitate introduction of a formal CPD program. In addition to facilitating CPD, the process should also allow the institution to collect and measure learning outcomes, which will be important in the college/school's own quality assurance efforts.

There will be challenges in implementing CPD while students are still in school. Most schools/colleges have a fairly prescriptive curriculum, making it difficult for students to implement an individualized learning plan. Providing every student with an opportunity to practice designing and implementing quality improvement projects or new pharmacy services may be logistically difficult. Students may feel that systematic assessment of their own learning needs is unhelpful if the pharmacy curriculum is inflexible. Development of proficiency in using multiple learning formats will be impeded if a program is primarily didactic in nature. Educators will need to approach these challenges with creativity and flexibility.

Preparing Educators and Practitioners for CPD

The revised ACPE accreditation standards (adopted January 2006) require enactment of an effective CPD program for all faculty members (full-time, part-time, and volunteer). See Standard No. 26: Faculty and Staff Continuing Professional Development and Performance Review.⁷⁴ The proposed language does not require that each college/school of pharmacy develop and administer their own CPD program, but does require support for CPD activities. Thus, if a consortium of stakeholders in a state or region develop a program for all practicing pharmacists in that region, it may be reasonable for a college/school of pharmacy to require their faculty to participate in the program. This is a useful distinction for colleges/schools from an area or state with several

pharmacy programs: it encourages colleges/schools to work collaboratively with pharmacy training sites and organizations (professional and regulatory) to develop a single program. A single statewide or regional program will be much easier to administer and more widely acceptable to practitioners than multiple small, institution-specific programs.

Faculty. Most academic institution-based faculty probably already use the CPD process (albeit not by name) through annual review of research output; the only additional step that some colleges/schools may need to add is a formal process of self-assessment. In addition to research evaluation, every school-based faculty member who teaches should use the CPD process to improve teaching skills. Although many colleges/schools are located on campuses that provide supportive coursework for teaching, those services are not often tailored specifically to teaching health sciences. AACP is ideally situated to play an important role in pharmacy educators' CPD. The institutes, meetings, Education Scholar, and networking AACP facilitates can and should be key components of a pharmacy educator's plan-act steps. AACP may consider programming that enhances the reflection-documentation steps in the CPD process for school-based pharmacy educators.

Leveraging the academic/practice partnership for CPD with preceptors. Preceptors who actively practice CPD not only provide a positive role model for students, but also create evidence of practice competence for patients, management, and educational or regulatory bodies. All practice site-based faculty, whether paid or volunteer, and all other practicing pharmacists who teach pharmacy students should use the CPD process advocated by the college/school. Having a single regional or statewide process would enhance the ability of a college/school to facilitate preceptor CPD engagement.

Preceptors are often regional leaders in many aspects of pharmacy practice and so should be encouraged to share their CPD experiences with students and with other practitioners. The academic institution can facilitate this process by highlighting in a published preceptor newsletter particularly innovative or well designed professional learning. The most logical interface for preceptor-school CPD information dissemination is the experiential education office. Professional organizations may wish to highlight selected members' professional growth through a central electronic or paper publication, similar to what is currently done in the UK.

There are several ways in which colleges/schools may facilitate their preceptor's CPD. Precepting students is a form of CPD—student evaluations often require a reflective component to the evaluation, and preceptors may use this opportunity to assess their own attitudes and expectations. Requiring such an assessment should thus be relatively easy. Most schools already formally gather evidence of preceptor teaching and practice skills; such evidence is ideal for documenting CPD. The college/school server might be used for storage, retrieval, and documentation of preceptor competence via the experiential education administration database. Such a system would likely need to allow access to competency documentation by the preceptor's employers or regulatory monitors. Colleges/schools often also offer formal preceptor training, which, combined with implementation of concepts with subsequent students taught by the preceptor, will offer preceptors a straightforward process for one of their CPD activities. Finally, colleges/schools offer a forum for creation of learning communities, where discussion about precepting innovations and challenges can stimulate individuals' development.

The revised ACPE accreditation standards (Standard No. 26) specifically state that pharmacy colleges/schools will need to have an effective continuing professional development program for all faculty, even volunteer faculty. This may place a significant administrative burden on colleges/schools that have hundreds of preceptors in their database. Even if colleges/schools currently have electronic space to document their preceptor's learning, most colleges/schools will require increased resources to comprehensively collect and update learning documentation. Busy clinical teachers may lack time and motivation to submit learning evidence. Additionally, if the CPD process is administered regionally or monitored by a regulatory body, then a school/college representative would need to be involved in the review process in order to meet the ACPE standard.

Other practitioners. In the past decade, there has been a decline in the numbers of colleges/schools with active continuing education (CE) programs. Academic institutions with such programs can enhance the CPD efforts of alumni and non-alumni practitioners by providing training in CPD concepts and processes. Existing CE programs should be encouraged to develop learning programs that go beyond traditional didactic education, using multiple learning formats and encouraging skill development at the pharmacist's practice site. CE programs can act as a CPD resource, but should not have direct responsibility for ensuring that CPD occurs.

Transitioning to a CPD Model

There are several steps that will assist colleges/schools in the development of an active CPD program for students and faculty.

First, colleges/schools should seriously consider forming planning alliances with key stakeholders--state associations, student representatives, practitioner representatives, other colleges/schools in the area, employers, state regulatory agencies, and others. Practitioners may find CPD unacceptable if they have to follow a different process or file separate paperwork for multiple monitoring groups. The steering committee should determine early in the process how they will measure practice competence.

Second, stakeholders should design or identify a learning inventory or similar kind of needs assessment process that can be used by practitioners working in a variety of practice settings to design their learning plans. This assessment should not only assist individual pharmacists in identifying learning needs, but should also collect data on proposed learning plans of those individuals. It will be useful for CE providers to have access to this information so they can design educational programs that will help pharmacists attain their learning goal and objectives. It may be desirable for professional pharmacy organizations at the national level to collaborate in the development of a needs assessment/learning plan development instrument.

Next, potential CPD program options should be piloted in a group of pharmacists and students from a variety of practice settings, to determine ease of program use for practitioners in each setting. It would be worthwhile to also identify a comparable group of practitioners from the same area and variety of settings who continue to use the current CE process so that outcomes can be compared. Piloted CPD programs should initially introduce and explain the CPD process to practitioners and provide formal training in the use of multiple learning formats.

During this transition, the steering group will need to distinguish the software and electronic space needed to administer the entire program. There should be continuous access (“24/7”) to CPD process instructions and record-keeping. Other considerations include adequate security; ease of sorting, batching, and sending information to individuals in the database; instructions for use that are easily understood; and the ability to collate information and generate reports that are usable for the monitoring group.

A final useful step is to develop a process of identifying and highlighting stories about pharmacists who are already practicing CPD successfully. Making these examples available to practitioners new to the concept of CPD will help ease concerns about implementation feasibility and may stimulate pharmacists to think creatively about their own learning.

Suggestion 1. Colleges/schools should integrate principles of CPD into the curriculum so that students can understand and apply the principles during their pharmacy education and throughout their pharmacy careers.

Suggestion 2. Colleges/schools should create learning communities of preceptors.

Suggestion 3. Colleges/schools should partner with other stakeholders (other pharmacy programs, practitioner groups, regulatory agencies, employers, etc.) to test the CPD process as an effective learning model for practice/practitioner development.

Tools, Resources and Methods

One way AACP can assist colleges/schools in CPD implementation efforts is to provide training in a variety of useful CPD tools, such as portfolios, structured professional learning needs assessment, use of multiple learning formats, development and implementation of new pharmacy services, competency assessment, and quality assessment methods. Each of these tools can be helpful in one or more of the CPD steps of reflect, plan, act, evaluate, and document.

Portfolios. Professional portfolio maintenance by practicing pharmacists was suggested by the 1994 AACP Commission to Implement Change in Pharmaceutical Education.⁷⁵ Portfolio development of some kind appears to be a component of most current CPD programs. A portfolio has been defined by the National Learning Infrastructure Initiative as a collection of authentic and diverse evidence representing what a person has learned over time, which includes a reflective component and has been organized for a particular purpose.⁷⁶ A portfolio is a useful tool for the documentation step in CPD. Portfolios need to document more than just learning, which is an intermediate step in the process of attaining competency. Because competency is combination of knowledge, skills, and attitudes, the portfolio will need to contain documentation of more than just knowledge and skills attained, and so needs to be more than just a collection of evaluations or test results. Demonstration of critical thinking in specific practice situations will be a necessary component of any portfolio. Reflective writing will be particularly important in allowing the pharmacist or student to demonstrate attitudinal competence. Ideally, portfolio structure development will also allow colleges and schools of pharmacy to measure learning outcomes of their students, and will seamlessly transition from a pre-graduate record to a lifelong learning record once the students become licensed.

Structured professional learning needs assessment. An important tool in the reflect-plan steps of CPD is development of a structured process allowing individual pharmacy practitioners to assess their professional learning needs. There are several excellent resources available. One outlines different strategies for conducting health education needs assessment.⁷⁷ The “Framework for Quality Drug Therapy” self-assessment available from the Academy of Managed Care (www.amcp.org) is intended to be used by individual pharmacists and other health care practitioners and by organizations of virtually any size. The tool provides individual practitioners and organizations with an online step-by-step process to identify, evaluate and improve upon specific task, skills and functions that contribute to effective medication therapy management. One of the most versatile strategies for conducting individual learning needs assessment is development of an electronic learning inventory. Development of such a tool that could be used by pharmacists nationwide might be a project in which AACP could participate, in collaboration with other pharmacy practice organizations.

Multiple learning formats. It has been shown that didactic learning alone is unlikely to significantly change practice habits. The current system of continuing education, which is primarily didactic in nature, thus should play a modest role in the design of CPD learning plans. Problem-based learning and case discussion exercises are learning formats which stimulate problem-solving and critical thinking skill development. Laboratory exercises allow skills practice, and the laboratory environment is ideal for competency testing of important skills such as patient interviewing, data analysis and evaluation, clinical problem-solving, evidence-based pharmacotherapy, and documentation of patient care activities. One unsung hero of learning formats is teaching. Preparation and delivery of instruction is an effective method for practitioners to develop and retain knowledge and skills (and, if the cards are played right, attitudes). Finally, experiential education is the forum for practitioners to develop proficiency in use of new or updated skills, knowledge, and attitudes. It is suggested that formal CPD programs require the use of multiple learning formats for the plan-act phases of CPD.

Development and implementation of new pharmacy services. The intent of CPD is for practitioners to acquire the knowledge, skills, and attitudes they need in order to improve their practice. For many pharmacists, improving practice will entail both development and implementation of some new pharmacy service, or improving an already-existing service. The service may involve patient care, such as monitoring and adjustment of anticoagulant therapy, or it may involve some aspect of pharmacy or information management. CPD should particularly facilitate the process of practice change, which will entail all five steps in the CPD cycle.

Competency assessment. All CPD programs will need to include some aspect of competency testing. Methods for testing competency include portfolio evaluation by peers or experts; objective, structured clinical evaluations (OSCEs); and focused discussion groups. Multiple-choice tests at their best measure knowledge application and cannot be used as the sole demonstration of practice competency. A CPD process that does not include some external evaluation of practice competence will be unenforceable, and so will be ignored by those practitioners who could most benefit from CPD.

Quality assessment. The ability to identify and creatively solve problems is the cornerstone of CPD. There is a plethora of quality measurement and development methods that would provide pharmacy practitioners with the skills to plan, act, evaluate, and document solutions to practice problems they encounter. Practitioners who learn these skills will be well-equipped to practice CPD. Although several tools are currently being applied to health care system quality assessment and improvement, exploration of methods used in non-health care-related fields may stimulate innovation in quality improvement processes.

Research Agenda—Unanswered Questions

The research agenda broadly should examine outcomes (e.g., practice change, professionalism), process/methods (e.g., compare models, develop or test tools, measurement/assessment, documentation, scope), and resources (e.g., cost-effectiveness, burden of documentation, individual and organizational investment).

The most pressing question is whether CPD as a learning model is more effective than the current continuing professional education (CPE) model. Research is needed to assess the effectiveness of CPD as a learning model for continued professional competence and practice change. What is the evidence that CPD is a better model for effecting behavior change (improving patient care or community health) compared to traditional continuing education participation? What are the desired outcomes that should be measured? While CPD has been proposed as a solution/strategy to address both continued competence and practice change, is there evidence to demonstrate influence on either? If CPD either does or does not stimulate positive practice change in most individual pharmacists, then it would be helpful to determine if there are subgroups of pharmacists (particularly those most in need of practice change) who either do or do not respond well to this model. When positive practice change does not occur, it would be ideal to determine what factors are involved, and if any other educational models could influence these factors. It would also be desirable to identify which CPD tools are essential for CPD success and which are non-essential but may provide added value for certain learning styles or environments. What is the relationship of a regulatory mandate (e.g., Ontario) to the effect of CPD on practice?

Within the available framework of tools it is unclear whether simple or more complex methods of reflection will enable clear ascertainment of learning needs. Most pharmacists will find formal complex learning needs assessments daunting, but lack the skills to informally self-identify learning needs; reflective tools at either end of these extremes will result in many pharmacists giving up altogether on their leaning. Research will be needed to determine a method of needs assessment that is both efficient and precise.

Interested faculty, particularly scholars in adult education, should be encouraged to pursue scholarly work (specific to that faculty member's discipline) to determine which elements of CPD produce behavioral change that produces better patient care. Colleges/schools should contribute their research expertise to partnerships with practitioner groups and other key stakeholders at the state level to test models of CPD and CPD effectiveness.

REPORT SUMMARY

Clearly the 2005-06 AACP standing committees and Argus Commission found much about the JCPP Envisioned Future for 2015 that is relevant to academic pharmacy. Some issues are global, such as the aging of the population and factors that will no doubt challenge the future pipeline of students grounded academically for health professions and research careers. We must remain aware of these and actively consider how they affect our future.

Other issues depend to a great extent on synergy between academic pharmacy and our practice organization colleagues and our collaboration with each other. We must constantly work to find new, effective and efficient means to create and sustain an energized faculty capable of stimulating in new generations of pharmacy students and alumni an insatiable desire to learn and apply new knowledge in the dawning “conceptual age”. Safe and effective medication use and the future of academic pharmacy both depend upon our ability to deliver on the promise of the 2015 vision.

Policy Statement 1: The 2005-06 RGAC recommends that the House of Delegates delete the Policy Statement proposed by the 1988 RGAC which is as follows:

AACP recognizes and strongly supports the primary function of the colleges and schools of pharmacy as being professional education, and recognizes the graduate education should not compete with, but complement, professional education. AACP should take an active leadership role in promoting pharmaceutical graduate education and research.

Policy Statement 2: Recognizing the importance of translational research in bridging the gap between emerging basic science discoveries and optimal pharmaceutical care, AACP should assume an active leadership role through its meetings and programs in integrating the goals of professional pharmacy education and pharmaceutical sciences graduate education and research, and to insure a strong future for pharmacy, an active leadership role in promoting graduate education and research

2005-06 COMBINED COMMITTEES' RECOMMENDATIONS

1. AACP should explore opportunities to engage pharmacy faculty members with the authors, editors, and publishers of kindergarten through grade 12 (K-12) science and health instructional resources and texts to encourage the inclusion in those resources principles, content, and concepts drawn from and relevant to the pharmaceutical, administrative, and clinical sciences. AACP also recommends that pharmacy faculty engage faculty colleagues in schools or departments of education on their campuses to explore partnerships to enhance the abilities of future teachers to ignite interest in science and health in elementary and secondary education.
2. AACP should convene a task force of thought leaders selected from among AACP members to consider the current evidence base to support the contemporary professional degree curriculum as defined by the CAPE Educational Outcomes (2004) and the ACPE Accreditation Standards and Guidelines (2006). This task force should construct a research framework (data elements and sources; research processes and principles) to lead academic pharmacy in a consideration of key curricular issues and to inform future curricular quality improvement at the institution-specific and national levels. The scope of the research framework should encompass the continuum of education from preprofessional through postgraduate continuous professional development. Consideration should be given to issues such as admissions criteria and required pre-professional study; scope of curricular content; effectiveness of instructional approaches and delivery strategies; relationships between faculty experience, credentials and continuing professional development with instructional effectiveness; impacts of various external factors on the process and outcomes of the curriculum; the validity of the CPD process and the evidence base for relationships between models of CPD and behavior (practice) change.
3. AACP should serve as a national instructional resource center to facilitate the development and dissemination of instructional resources and courses to support the delivery and/or enhancement of:
 - a. professional degree programs (to produce new practitioners);

- b. graduate degree programs in the pharmaceutical, administrative, clinical, and cognitive sciences (to produce research specialists, to produce education specialists); and
 - c. certificate- and degree-granting programs to meet the continuing professional development needs of practitioners (to educate experienced practitioners, to produce clinical specialists).
4. The Section of Continuing Professional Education is the AACP member group with expertise to shape the future of continuing professional development. The Section should investigate the applicability of existing frameworks for self-assessment and portfolio development to support continuous professional development principles and processes relative to acculturation of professional students and to faculty and preceptors as indicated in the proposed ACPE Standard 26 “Faculty and Staff Continuing Professional Development and Performance Review”.
5. Given the trends of the early 21st century that are influencing the delivery of health services and the vision for pharmacy practice in 2015 articulated by the Joint Commission of Pharmacy Practitioners (JCPP), a future Argus Commission should be charged to envision the characteristics of the pharmacy profession at the end of the first quarter of the 21st century (2025). In light of this envisioned future, delineate its implications for pharmacy education and considerations that must be before the academy now to influence, prepare for, and optimize pharmacists’ contribution to society in this timeframe.

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Future Vision of Pharmacy Practice
Joint Commission of Pharmacy Practitioners
November 10, 2004

Vision Statement

Pharmacists will be the health care professionals responsible for providing patient care that ensures optimal medication therapy outcomes.

Pharmacy Practice in 2015

The Foundations of Pharmacy Practice. Pharmacy education will prepare pharmacists to provide patient-centered and population-based care that optimizes medication therapy; to manage health care system resources to improve therapeutic outcomes; and to promote health improvement, wellness, and disease prevention. Pharmacists will develop and maintain:

- a commitment to care for, and care about, patients
- an in-depth knowledge of medications, and the pharmaceutical*, biomedical, sociobehavioral, and clinical sciences
- the ability to apply evidence-based therapeutic principles and guidelines, evolving sciences and emerging technologies, and relevant legal, ethical, social, cultural, economic, and professional issues to contemporary pharmacy practice.

How Pharmacists Will Practice. Pharmacists will have the authority and autonomy to manage medication therapy and will be accountable for patients' therapeutic outcomes. In doing so, they will communicate and collaborate with patients, care givers, health care professionals, and qualified support personnel. As experts regarding medication use, pharmacists will be responsible for:

- rational use of medications, including the measurement and assurance of medication therapy outcomes
- promotion of wellness, health improvement, and disease prevention
- design and oversight of safe, accurate, and timely medication distribution systems.

Working cooperatively with practitioners of other disciplines to care for patients, pharmacists will be:

- the most trusted and accessible source of medications, and related devices and supplies
- the primary resource for unbiased information and advice regarding the safe, appropriate, and cost-effective use of medications
- valued patient care providers whom health care systems and payers recognize as having responsibility for assuring the desired outcomes of medication use.

How Pharmacy Practice Will Benefit Society. Pharmacists will achieve public recognition that they are essential to the provision of effective health care by ensuring that:

- medication therapy management is readily available to all patients
- desired patient outcomes are more frequently achieved
- overuse, underuse and misuse of medications are minimized
- medication-related public health goals are more effectively achieved
- cost-effectiveness of medication therapy is optimized.

- “pharmaceutical” is not included in the original JCPP statement, but its inclusion is strongly supported by AACP and is used in that form by AACP.

SPECIFIC 2005-06 COMMITTEE CHARGES

Academic Affairs

The 2005-06 Academic Affairs Committee was charged with scanning the higher education, health professions education, scientific, and clinical practice environments and provide for the academy a synthesis of the key trends and factors most likely to influence pharmacy education in the next 10 years. With the JCPP “Future Vision of Pharmacy Practice in 2015” and the results of the environmental scan as the context, along with the revised accreditation standards and guidelines specific to Mission, Goals, and Evaluation; Curriculum; and Faculty and Staff, the committee was specifically charged to suggest the nature, organization, and composition of the faculty needed to deliver the educational program necessary to prepare students for practice in 2015 and beyond. In conducting its work, the committee was encouraged to consider 1) issues related to the need for “retooling” of continuing faculty, 2) faculty credentials necessary and meaningful to the implementation of the curriculum and achievement of an institution’s mission and goals, and 3) the array and scope of the individual and collective faculty expertise.

Professional Affairs

Given Association policy in support of the concept of continuous professional development and the focus of the profession and consumer advocates on assuring continued competence (PAC-4), President Diane Beck asked the 2005-06 AACP Professional Affairs Committee to consider the role of AACP and member institutions in supporting the transition from a continuing education model to a continuous professional development model for lifelong professional competence and also, to identify and propose strategies for establishing the research agenda to assess the effectiveness of continuous professional development as a learning model. Specifically, the Committee was charged to:

- Explore the role of AACP and its member institutions in the continuum of learning. What should colleges and schools of pharmacy do to prepare students for a continuum of learning throughout their career to foster continued professional competence? What is the role of colleges and schools of pharmacy relative to continuous professional development of practitioners?
- Propose strategies for the Association to facilitate the transition to continuous professional development for member institutions.
- Identify and propose strategies for establishing the research agenda to assess the effectiveness of continuous professional development as a learning model for continued professional competence.

Research and Graduate Affairs

In the future, the pharmaceutical sciences faculty in pharmacy colleges and schools will consist of Ph.D.-degreed individuals with little or no background or understanding of contemporary pharmacy practice. While a similar situation occurs in medical education in that biomedical sciences faculty do not practice medicine, the disconnect between science and practice faculty does not appear as significant or, alternatively, the science and practice faculties both understand and respect each others roles in the institution to a greater degree. This concordance between biomedical science and medical practice is in no way related to how or how much physicians use science in practice. Evidence suggests they use science very little in the diagnoses of disease, their primary function.

A previous Research and Graduate Affairs Committee proposed and the AACP House of Delegates passed the following policy statement:

AACP recognizes and strongly supports the primary function of the colleges and schools of pharmacy as being professional education, and recognizes the graduate education should not compete with, but complement, professional education. AACP should take an active leadership role in promoting pharmaceutical graduate education and research. (*Source: Research and Graduate Affairs Committee, 1988*)

The 2005-06 RGAC was asked to consider this policy statement and either affirm it, modify it, or propose its elimination. If the former, what can colleges and schools do to enhance the complementary relationship between graduate and professional degree programs? The Research and Graduate Affairs Committee was also charged to consider the following questions:

- What pharmacy faculty and non-pharmacy faculty resources are needed to provide the desired science-based instruction in the professional curriculum? What about the use of multi-institution, shared-faculty resources through the use of distance learning or the use of adjunct or part-time faculty in providing “required” curricular content? How does an institution address faculty resources required for the professional degree program with those required for the research and graduate education mission of the institution?
- What can or should individual institutions or AACP do to acculturate the increasing number of pharmacy science faculty to the profession of pharmacy? For those pharmacy science faculty within academic health centers, is there any value in differentiating themselves from medical, nursing, or public health school faculty? If not, is there more value in a biomedical college faculty that services the various health professional schools science education requirements, with each school retaining a smaller specifically focused professional program faculty?
- As the majority of graduate students are foreign-born or U.S. citizens without a pharmacy background, their relationship with professional degree students is much different than those graduate students of a generation ago, who had completed a pharmacy professional degree education, particularly those holding a teaching assistantship. What, if anything, can be done to synergize the relationships between those two student groups existing within the same institution?

Argus Commission

It is becoming increasingly apparent that U.S. elementary and secondary students do not perform at the highest levels in the areas of mathematics and science, based on the results of international examinations. Whether you agree with the politics behind it or not, The No Child Left Behind initiative was strongly supported by both parties and both Houses of Congress because of the overwhelming evidence that many U.S. students were attending school and not learning to read, perform simple arithmetic functions, or have an elementary understanding of the world around them. This is especially the situation in certain minority groups in the U.S. The higher education academic community, except for those intimately involved in elementary and secondary teacher training, has stood above and away from this issue for too long. Its impact on university budgets has been significant as considerable effort has been undertaken to remediate post-secondary students for college-level work. Even those institutions that have adopted a no remediation policy have been affected as faculty members are required to “dumb-down” coursework or risk unacceptable failure rates.

In pharmacy, the increased demand for admission to the professional curriculum has allowed institutions the luxury of choosing the “best” students. Drop out rates are currently very low, yet the complaint of unprepared students moving from year-to-year continues. Many in the academic community openly state that students are not prepared for practice upon graduation and need one or two more years of residency training. Given this background, the 2005-06 Argus Commission was charged to consider the following questions:

- What is it that pharmacy colleges and schools can do either alone or as part of a university effort to prepare elementary and secondary school students for higher education, particularly in selected minority communities. Should pharmacy join or lead efforts in this area?
- The Commission to Implement Change in Pharmaceutical Education suggested a two-year minimum for the pre-professional curriculum. Is this still germane? Should preparation for the professional curriculum be based on years of study and courses taken, or by competence? Does the PCAT® discriminate between levels of pre-professional education, either in quality or quantity?
- What role do biomedical and pharmaceutical sciences have in the contemporary practice of pharmacy?