Chair Report for the Research and Graduate Affairs Committee

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The AACP By-laws state that the Research and Graduate Affairs Committee (RGAC) is to provide assistance to the Association in developing its research, graduate education, and scholarship agenda. This assistance may include facilitating colleges and schools in formulating and advancing legislative and regulatory initiatives and nurturing collaborative activities with organizations sharing an interest in issues related to the pharmaceutical sciences.

The following charges were given to the 2000/2001 Research and Graduate Affairs Committee by AACP President Victoria F. Roche regarding the education and preparation of clinical and pharmaceutical sciences faculty, and the life-long learning of science by pharmacy practitioners. The rationale for President Roche’s charges are described in more detail under the topic of “Ignite the Passion for pharmacy practitioners. The rationale for President Roche’s charges are described in more detail under the topic of “Ignite the Passion for Pharmaceutical Science” found in her presidential address at the 101st AACP Annual Meeting(1).

- identify strategies to be employed in post-professional education that will fuel the passion for the basic sciences and strengthen the commitment to base therapeutic decisions on scientific evidence, in those who practice the profession and educate our students;
- consider whether AACP should establish policy advocating for a strong basic pharmaceutical science component in clinical residency and fellowship programs;
- determine what AACP and its member institutions can do to instill in PhD students an understanding of pharmaceutical care and the crucial impact of their discipline’s research on safe and effective pharmacy practice;
- explore what AACP and its member institutions can do to encourage PhD students’ interest in an academic career;
- suggest strategies to enhance interest of new PhD faculty to partner with clinical colleagues to reinforce the importance of the pharmaceutical sciences throughout the professional curriculum;
- examine whether AACP should establish policy that advocates education on the topic of pharmaceutical care for graduate students in member institution’s graduate programs; and
- determine whether AACP should establish policy that advocates inclusion of pharmaceutical science components to all continuing education programs sponsored by its member institutions.

INTRODUCTION

Several of the recommendations address strategy or policy to reinforce the importance of science throughout the curriculum: (i) increase understanding and “passion” of students and practitioners for the basic and pharmaceutical sciences; (ii) increase understanding of pharmaceutical sciences faculty for pharmaceutical care; and (iii) increase the cooperation between pharmaceutical sciences faculty and clinical (practice) faculty. These charges suggest that science, particularly the pharmaceutical sciences, are not being sufficiently taught or appreciated by students and practitioners, and that it is not a significant concern of practice faculty or a topic much discussed in continuing education programs. The charges stimulated considerable discussion among the present RGAC membership, which included a diverse group of faculty and administrators.

The discussion raised a concern about use of the term, “basic science” or “basic pharmaceutical sciences” as a technique to distinguish one discipline from another, and specifically to distinguish pharmaceutical sciences faculty from practice faculty, including those who are active clinical scientists. While the intent of the term “basic” may be to provide additional information to the reader or listener, it is often used and interpreted as pejorative to a discipline not considered “basic” by the writer or the speaker. In view of the misunderstandings that arose in the committee discussions with the use of the word “science,” its related term, “research,” and particularly the use of modifiers, such as “pharmaceutical,” “basic,” “applied,” and “clinical,” the RGAC thought a background discussion of the terms would be useful for the entire academy.

BACKGROUND

The term, “science” (Latin scientia, from scire, “to know”) describes both a process and the product of that process, knowledge(2). Science includes the observation, identification, description, experimental investigation, and theoretical explanation of phenomena, usually natural phenomena when used to describe an activity or process. Research and science are used interchangeably when used to describe an activity or process. The experimental techniques and processes used to “do science” or conduct research are common across many disciplines, and thus the terms, “basic,” “applied,” or “clinical” have little meaning when used to describe the process of science, except that “clinical” is used to refer to the subjects of the research process. Later in this discussion, examples of how the terms “basic” and “applied” will be used to describe science based on the scientist’s intent of the usefulness of the outcomes of his/her research.

The RGAC agrees that all students and practitioners should understand and appreciate the variables associated with the science or research process, often referred to as the scientific method. Understanding the scientific method is essential if a curriculum is going to fulfill the Center for the Advancement of Pharmaceutical Education (CAPE) outcomes in a number of competencies, including the categories entitled: Provide Pharmaceutical Care, Drug Information and Education, and the General Abilities Outcome of Thinking(3). Students and practitioners cannot evaluate the medical and pharmaceutical literature or use it to conduct an evidenced-based practice if they do not understand how to interpret the validity and limits to extrapolation of research studies, particularly clinical research.

Terms such as “the biological sciences,” “the physical sciences,” “the biomedical sciences,” and “the pharmaceutical sciences,” are used to describe the body of knowledge in a particular field. Some scientific disciplines (e.g., statistics) are found in every field, or in multiple fields (e.g., pharmacology/toxicology). The terms, “basic,” “applied,” and “clinical” are used to describe and differentiate scientific disciplines, but the usage of these terms is misleading as there is...
mix of fundamental knowledge and application in most disciplines. Despite this mixture of basic and applied components to all sciences, their usage is engrained in the academic culture, often with the user’s own interpretation of their meaning.

The characterization of science as basic or applied has ancient roots, but the usage became institutionalized in both the research community and government agencies after the post-WWII report of Vannevar Bush, “Science—the Endless Frontier: A Report to the President for Postwar Scientific Research” (4). Bush was director of the wartime Office of Scientific Research and Development. In 1944, he was asked by President Franklin D. Roosevelt to develop a vision for the continued role of government in scientific research after the end of the war, and Science—the Endless Frontier expressed that vision. A complete discussion of the impact of Bush’s report on the continuation of government funding of scientific research is not within the purview of this report. However, Bush’s definitions of basic research and its relationship to applied research had and continues to have a dramatic impact on the Federal Government’s science policy (e.g., NIH, NSF). Bush’s views also gave rise to a linear model of technological progress that is still accepted by many in government, industry, and academia. A more complete discussion of Bush’s views of basic and applied science (research) and its subsequent impact on the way government agencies and the media view science is found in Donald E. Stokes’ book, “Pasteur’s Quadrant: Basic Science and Technological Innovation” (5). The following discussion is also based on that book.

Stokes noted that Bush coined the term, “basic research” and specifically distinguished it from applied research. Bush’s conceptions of basic and applied research made the two conceptually or analytically different, with basic research focused exclusively on understanding, and applied research focused on use. Bush also developed the idea that a premature focus on the practical ends of research destroys the creativity of basic research, which deals with “general knowledge and an understanding of nature and its laws.” Bush also expressed the view that technological progress only arises some time after basic science discovers new knowledge or principles. This is the “linear model” of technological development (Figure 1). Bush asserted that “a nation which depends upon others for its new basic scientific knowledge will be slow in its industrial progress and weak in its competitive position in world trade.” Bush also stated that:

- “...basic research is performed without the thought of practical ends.”
- “...applied research invariably drives out pure (research)...”
- “Basic research is the pacemaker of technological progress.”

The distinction between basic and applied science within academia is often used to infer that one doing basic science (research) is somehow “better” than one conducting applied science (research). This is illustrated by a quote from C.P. Snow from his well-known analysis of the “two cultures.”

“We prided ourselves that the science we were doing could not, in any conceivable circumstances, have any practical use. The more firmly one could make the claim, the more superior one felt” (6).

This unwritten, unspoken, but often inferred communication that “my research or science is more “basic than yours” is common on research university campuses and even within colleges, schools, and departments.

Fig. 2. The quadrant model of scientific research proposed by Stokes.

Stokes provides a number of examples to refute the Bush suggestion that basic and applied research are inherently different activities, including the research of Louis Pasteur, which forms the basis for the book’s title. Pasteur’s research varied from improving the technology of fermentation to the development of the germ theory of disease. His entire career was filled with examples of movement between fundamental knowledge and technological improvement, and not always in the same direction. Stokes describes various models developed to address the either basic or applied quandary resulting from Bush’s view of science, including one of his own, which he terms Pasteur’s Quadrant (Figure 2). Unfortunately, his new model adds another confusing term, “pure,” to the ranges of basic and applied research. He should have consulted Dr. Pasteur who stated:

“There does not exist a category of science to which one can give the name applied science. There are science and the applications of science, bound together as the fruit of the tree which bears it.” (7)

While the stated Federal Government’s policy is to primarily support basic science, it is difficult to obtain federal funding for something that has no potential use. This contradictory research funding policy is evidenced by the Congress’s relatively poor funding of the National Science Foundation, perhaps because it is too “basic.” Congress also continues to criticize the National Institute of Standards and Technology (NIST) Advanced Technology Program (ATP) as placing the government in the position of picking winners or losers in new technology. The NIST ATP was a favorite of the Clinton White House, but its funding was often reduced by the Republican Congress. President Bush has recommended a dramatic reduction in ATP funding in his initial budget (8).

NIH has successfully navigated the basic vs. applied research conundrum by adopting a philosophy analogous to Pasteur’s Quadrant or use-inspired basic research: “The NIH mission is to uncover new knowledge that will lead to better health for everyone” (9). Thus, the research supported by the NIH is applied because it has a definite use, but simultaneously NIH defines itself as the agency supporting “basic biomedical research” through emphasis on its support for the acquisition of new knowledge that has potential for use in improving the public’s health. The NIH emphasizes use for the public and Congress. Disease advocacy groups lobby Congress for increased NIH funding because they expect the investment of tax dollars for research on their disease will result in prevention, cure, alleviation of symptoms and prolongation of life. Conversely, NIH emphasizes the discovery of knowledge to the academic community, which values “basic” over “applied” research.

Pharmaceutical scientists seeking NIH support for problems that have more immediate and obvious application thus have two options to get around the dilemma of the agency’s stated goal, and its study
theses' inherent bias of supporting or favoring "basic" research, and referring applied research problems to the private sector (e.g., pharmaceutical industry). One technique is to use grant writing techniques that convince reviewers that the proposed research is focused on uncovering new knowledge that has the potential of leading to better health. Frustrated by study section members' bias against "applied" research and development of advanced technologies, bioengineers and imaging scientists solicited the assistance of Senator William Frist and obtained their own NIH institute over the objection of the Clinton administration and NIH. These scientists do not cover up the fact that they perform applied research.

"The mission of the National Institute of Biomedical Imaging and Bioengineering is to improve health by promoting fundamental discoveries, design and development, and translations and assessment of technological capabilities in biomedical imaging and bioengineering, enabled by relevant areas of physics, chemistry, mathematics, materials science, information science, and the computer sciences."(10)

NIH and other government agencies that fund research also finesse their way around Bush's either/or paradigm of "basic" and "applied" science or research. NIH supports large clinical trials designed to determine the efficacy of competing disease treatments, and more recently has funded studies designed to determine if complementary and alternative therapies are more effective than placebo, although the latter activity, like the Small Business Innovation Program (SBIR) and the Small Business Technology Transfer (STTR) program were forced on NIH by Congressional legislation. NIH has supported the very practical problem of sequencing the genomes of a number of bacterial species, a worm, several laboratory animals, and man. It is interesting to speculate whether private industry would have sequenced the genome without NIH involvement. In fact, a private company, Celera, has played a large role in the entire process. No one would argue that well-designed clinical studies or the characterization of the human, animal, and bacterial genomes also has the potential to uncover new knowledge, but that argument could be applied to almost all research.

ARE THE PHARMACEUTICAL SCIENCES BASIC OR APPLIED?
The American Association of Pharmaceutical Scientists (AAPS) states that, "The pharmaceutical sciences combine a broad range of scientific disciplines that are critical to the discovery and development of new drugs and therapies." Additionally, "A pharmaceutical scientist discovers and develops life-saving medicines and devices that allow healthcare professionals to treat patients"(11). Vannever Bush would not hesitate to label all the pharmaceutical sciences as applied sciences, as each is directed at a specific goal, from drug discovery to defining drug efficiency or efficacy in human subjects. What then are the basic pharmaceutical sciences, or is this term an oxymoron? If an author or speaker uses the term basic to refer to a specific discipline because it uncovers new knowledge, are they implying that research in another (i.e., your) discipline does not uncover new knowledge? Does use of the term basic to describe one’s research or discipline suggest a superiority over colleagues whose research or discipline has a more applied use? In summary, does the use of basic as added to the terms, "science" or "pharmaceutical science(s)," give the intended audience more understanding, confusion, or discomfort?

"Freed from the false, “either-or” logic of the traditional basic/applied distinction, individual scientists would more generally see that applied goals are not inherently at war with scientific creativity and rigor, and their overseers and funders would more generally see that the thrust toward basic understanding is not inherently at war with considerations of use."(12)

Recommendation 1: The pharmacy academy should consider discontinuing using the term “basic” in an attempt to differentiate one pharmaceutical science discipline from another or one portion of the curriculum from another. The pharmaceutical sciences are goal- or use-directed and all have the potential to uncover new knowledge that has uses beyond what was originally envisioned by individual pharmaceutical scientists in their research. The term, “basic sciences” should be reserved to refer to disciplines such as physics, chemistry, and biology (i.e., zoology, botany, and microbiology). The term, “biomedical sciences” should be used for disciplines such as anatomy, physiology, medical microbiology, immunology, and pathophysiology.

SCIENCE AND PRACTICE
The RGAC unanimously agreed that pharmacy practitioners need to be grounded in science (process and disciplines), and that pharmaceutical scientists need to be familiar with the goals of contemporary pharmacy practice. Although AACP does not have a policy statement in this area, the Commission to Implement Change did address the relationship of pharmaceutical care and science, both process and knowledge.

“While most professionals prepared by pharmaceutical education are not scientists, all need to use scientific knowledge and scholarly principles in solving problems. An understanding of scholarship is absolutely necessary if students are to embark on a professional career of lifelong learning.”(13)

The RGAC concluded during its discussion that:

• There is indeed a continuing disconnect between pharmaceutical sciences faculty and practitioners.
• We do not know how much “science” is used by practitioners in day-to-day practice.
• We do not know how much “science” a practitioner needs to learn or relearn on an annual basis to remain competent.
• Most practitioners appear to extend their science knowledge as they mature in their practice.
• Science is most valuable to practitioners when traditional solutions to clinical problems fail.
• The understanding of science as a process (e.g., research methodology) is important for practice.

Again, AACP does not have a policy statement regarding the relationship between science and practice, but the Commission to Implement Change in Pharmaceutical Education stated the following:

“The provision of pharmaceutical care to patients requires an understanding of the chemistry of drug entities, the delivery characteristics of dosage formulations, the disposition of drugs within the body, and the physiologic and pharmacologic outcomes of drugs’ interactions with the biologic organism. What makes pharmacists unique among health care providers is a detailed and comprehensive understanding of the implications of these physical, chemical, and biological interactions on the outcomes of drug therapy.”(14)

The Commission’s view that pharmacists are “unique” among health care providers in their understanding and use of pharmaceutical science in their practice deserves examination. While the pharmacy academy believes this to be true, the extent to which science knowledge is used in pharmacy practice is unknown because it has not been examined in a scholarly manner. Should the relationship between science knowledge and practice be studied?

There is a growing body of literature on the reasoning and knowledge physicians use to construct diagnosis. It would appear that “organization of knowledge is the key in the construction of clinical expertise” and organizational ability, which arises from continued
practice, may be as important as knowledge acquisition in the development of expertise in diagnosis (15, 16). Biomedical knowledge is used more for unfamiliar or atypical cases or by students in their first encounters with patients. Diagnosis is essentially a categorization task, so it is not surprising that physicians develop expertise with clinical experience. Although there have been significant changes in the technology to assist or verify a physician diagnosis, diseases do not change dramatically from year-to-year. Disease symptoms vary from patient-to-patient, and the more patients a physician examines with a particular disease state, the better he/she becomes in incorporating that variability into their diagnosis process. The recognition of the range of symptom quality and quantity can only occur through multiple patient encounters, which contributes to the continual reorganization of knowledge in building expertise. Expert physicians appear to reason data to hypothesis, not from hypothesis to data, which is more common among medical students and novice practitioners.

Does the importance of physician clinical experience and its role in knowledge organization hold true for the treatment selection? Does a physician develop expertise in choosing drug therapies for chronic diseases when there are multiple treatment choices that change with regularity, and when the drug therapy outcomes are often unknown for six to twelve months after therapy is initiated? Understanding biomedical/pharmaceutical science may play a more important role than knowledge organization in choosing drug therapy, and the physicians’ lack of understanding the science underlying drug action may account for poor outcomes of much drug therapy. Pharmaceutical care was pharmacy’s solution to these poor outcomes of contemporary drug therapy, and there is accumulating evidence that pharmaceutical care and certain pharmacist-provided services can improve drug therapy outcomes.

Unfortunately, the impact of pharmacy and pharmacists on identifying, preventing, and resolving drug-related problems is not as significant as its purported potential (17). What roles do knowledge organization, knowledge acquisition, and communication skills play in the development of pharmaceutical care expertise? Presently, pharmacy recognizes practice expertise from the results of a paper/pencil examination. Studying how novice and “expert” pharmacists organize and use pharmaceutical and biomedical knowledge in their practice settings, particularly when they choose to actively intervene and change or modify a physician’s drug therapy decision, would be extremely useful in the respective quantities and placement of pharmaceutical/biomedical science instruction and clinical experience within the curriculum and in the construction of life-long learning experiences.

The ongoing debate with the academy regarding the respective roles of understanding the pharmaceutical sciences, the scientific method, and practice experience play in the development of pharmaceutical care expertise within students and practitioners will remain at the level of opinion and anecdote until there is a significant and validated body of evidence on how pharmacists accumulate and organize knowledge and use it to identify and resolve drug-related problems. This is important for professional degree program curricular design, formal post-degree experiences such as residencies, and on the structure of life-long learning education programs.

POST-PROFESSIONAL DEGREE STRATEGIES FOR TEACHING SCIENCE

The committee did not believe that AACP should adopt policy advocating more pharmaceutical science instruction in residency programs as they are presently structured. There are opportunities for teachable moments in a residency program to emphasize the role of science in solving clinical problems. However, incorporating more science into current practice-oriented residency programs would be difficult because:

- The purpose of a residency is to attain professional competence in direct patient care and in practice management beyond entry-level.
- Residencies generally do not have any formal didactic components, although residencies are encouraged to provide opportunities for the resident to obtain extramural education.
- Residencies require the completion of an appropriate project, including original research, but the common one-year program would limit the extent of any research project.

The committee extensively discussed the importance of understanding the scientific method as it relates to a person’s ability to conduct research and publish in scholarly journals. It was suggested that some college/school of pharmacy-sponsored residency programs be restructured to offer more didactic components, with particular focus on increasing competency in the area of research methodology, for pharmacy residents with expectations of an academic career. The University of Minnesota, for example, is presently offering a two-year residency program for PharmD graduates who have expressed an interest in pursuing an academic career. While it is too early to determine the effect of an additional year on the career outcomes of the participants, it is an option. Other options include the addition of one or two more years of a research fellowship in addition to a residency, or the addition of didactic instruction leading to a graduate degree (MS, PhD) or an advanced certificate program in clinical research.

PharmD graduates who pursue an academic career with only one year of a practice residency are at a significant disadvantage if appointed directly into a tenure-track position at many of our member institutions, because they are unprepared to fulfill the research/scholarship requirements in the time period available. An option available to these individuals is either a non-tenure track appointment primarily focused on teaching and practice, a delay in the start of the tenure-track clock (e.g., initial appointment at the instructor level), or an elongation of the period before the tenure/promotion decision. Not every college or school of pharmacy has a research focus, so it is possible to successfully achieve tenure or academic promotion at those institutions without a significant research or publication expectation. Residents exploring an academic career should be made aware of institutional expectations during the recruitment process, including the impact of different institutional research requirements on their ability to move within the academy with tenure and appointment status intact.

Recommendation 2: The RGAC encourages member institutions to develop multi-year residencies/fellowships specifically designed to prepare recent PharmD graduates for academic careers. Consideration should be given to coupling the residency/fellowship experience with a program of study that leads to a graduate degree (i.e., MS, PhD).

PROVIDING AN UNDERSTANDING OF PHARMACEUTICAL CARE TO PHD STUDENTS AND NEW PHD FACULTY

The impetus behind the two charges related to PhD students in the pharmaceutical sciences is the realization that fewer pharmaceutical sciences graduate students have U.S. pharmacy educational backgrounds. There are a considerable number of pharmaceutical sciences graduate students with degrees in pharmacy from foreign countries where the concept of pharmaceutical care is not familiar. It is anticipated that not understanding the concept of pharmaceutical care would have several potential deleterious effects on graduate students including: (i) a decreased interest in an academic career in pharmacy, and (ii) a decreased potential for collaboration with practice faculty, both in curricular and research issues, for those individuals who did choose an academic career.

There was concern expressed that graduate students already have too many obligations to be candidates for any type of program that would increase understanding of pharmaceutical care. In addition to graduate classes, seminars, and qualifying exams, graduate students are focused on completing their research projects. At most institutions, additional instruction requirements in research ethics and the use of animals in research already are in place.

Inasmuch as an increasing number of pharmacy faculty received their PhD education and postdoctoral training in non-pharmacy institutions, there is also a need for a formal program of introducing new pharmacy faculty to the concepts of pharmaceutical care for the same
reasons outlined previously for graduate students. It does not have to be a time-consuming program, but visible support and encouragement by the deans and department heads is imperative to demonstrate institutional commitment to the activity. Having new faculty accompany practice faculty several times to exemplary acute or ambulatory care settings could provide insight as to what the overall educational process is attempting to accomplish and how the new faculty’s discipline fits into the overall structure of pharmacy practice.

INCREASING PHARMACEUTICAL SCIENCE GRADUATE STUDENT INTEREST IN ACADEMIC CAREERS

The RGAC reviewed materials describing the Preparing Future Faculty (PFF) program that was launched as a joint effort of the Association of American Colleges and Universities and the Council of Graduate Schools in 1993(19). The PFF program was designed to provide graduate students with interests in academic careers an opportunity to teach and participate in the academic culture in other institutions with diverse student bodies. This was accomplished through “clustering” arrangements between a research university with large numbers of graduate students and other liberal arts and community colleges in the geographic area. The program has expanded beyond the original clustering concept with variations that are PFF-like and only incorporate some of the PFF activities for interested graduate students such as:

- forums for faculty members to describe and analyze their professional lives;
- discussion with PhD-program alumni about their careers;
- courses on teaching specific disciplines;
- seminars on professional issues;
- discussing teaching in a multicultural setting;
- helping students develop portfolios documenting expertise in teaching, research, and service;
- providing TAs with promotion opportunities with titles and pay to reflect expanded responsibilities; and
- having graduate students teach a unit or entire course and obtain student feedback.

A PFF-like program of interest is the new PFF in the Professions (PFFP) Program that has recently been instituted at Virginia Commonwealth University (VCU) for future faculty in all the professions, including pharmacy(20). This new program is being funded by a FIPSE grant. The PFFP consists of a general seminar, four “cluster seminars” lead by faculty from one of the professional areas, and a professional teaching internship. All the seminars and internships are listed as graduate school level courses and have assignments of one to three credits. Completion of all three components can result in a certificate for the participant. In addition to VCU-pharmacy graduate students enrolled in the program, several new pharmacy faculty are participating.

Another approach to increasing graduate student interest in academic careers is the implementation of programs similar to that developed by the University of Pittsburgh(21). The “Survival Skills & Ethics Program” is based on eight workshops offered during the academic year on topics designed to improve graduate student success in whatever career they chose upon graduation, including academic careers. The Pittsburgh Survival Skills program has been successfully exported to other institutions through week-long “Training the Trainers” workshops for faculty members and administrators who wish to implement the program at their own institution.

“The very fact that “professional responsibility” is taught in the university to everyone except those headed for the academic profession is a powerful message in itself.”(22)

All the pharmaceutical sciences are facing an increase in retirements in the next decade due to aging of the faculty. The numbers and age distribution of pharmaceutics faculty are illustrative for all pharmaceutical sciences faculty (Figure 3). This potential increase in turnover provides opportunity for institutions to strategically plan their teaching needs and research foci for the future. Hiring faculty from outside the pharmaceutical sciences will offer opportunities and challenges as these individuals will need to be oriented to the desired outcomes of the professional degree curriculum. The RGAC suggested that orientation would be an opportune time to introduce pharmaceutical sciences faculty to the research interests and environments of the practice faculty.

Recommendation 3: The RGAC recommends that member institutions with graduate degree programs leading to the PhD in the pharmaceutical sciences provide graduate students with programs designed to “enhance their professional development,” including career selection. Institution deans and department chairs should encourage and provide support for graduate students and new faculty to attend university and professional association-sponsored programs designed to improve teaching skills. New faculty without pharmacy backgrounds should be encouraged to accompany practice faculty to their practice sites to gain experience with contemporary pharmacy practice.

FACULTY COLLABORATION

The charge to the RGAC focused on the importance of collaboration as a means of reinforcing the importance of the pharmaceutical sci
ences throughout the curriculum. There was general discussion of the support for collaboration in research and teaching at the university, college, and department level. It is important for new faculty to demonstrate their “independence” in teaching and research, so many faculty avoid collaboration until promotion and tenure is achieved. Inasmuch as success in research will require collaboration in the future, the RGAC suggested several potential actions that deans and department chairs can take to support collaborating faculty:

- Provide new faculty opportunities for collaboration by making a special effort to introduce them to other faculty with similar or complementary research interests.
- Encourage or do not discourage joint appointments in other departments, divisions, and colleges.
- Eliminate administrative barriers associated with research funding of collaborative research.
- Encourage, recognize, and reward collaborative research.
- Ensure that tenure and promotion criteria specifically explain how multidisciplinary or collaborative research contributions will be evaluated.

RECRUITMENT AND RETENTION OF PROFESSIONAL DEGREE PHARMACY GRADUATES INTO ACADEMIC CAREERS

Many pharmacy programs expend considerable effort each year in recruiting pharmacy practice faculty. There are a number of factors that are making recruitment very difficult. These include: (i) a tight labor market; (ii) non-competitive academic salaries; and (iii) a shortage of PharmD graduates with residency and fellowship experience. The RGAC previously observed that it was unfair to hire practice faculty without two to three years of post-PharmD training, particularly into tenure-track positions. Unless new practice faculty have time to develop their practice sites and begin a research program, they are being set up to fail in their academic careers. These are not new issues for the academy(23).

The recruitment of pharmacy practice faculty is made more difficult by the significant turnover of faculty in this area. Reasons for this high turnover include: (i) individuals unprepared to address the many requirements of an academic position; (ii) non-competitive academic salaries; (iii) an unwelcoming or hostile college/school culture; and (iv) challenging non-academic positions. Additionally, practitioners with academic experience increasingly appear to have the qualifications sought by the pharmaceutical industry. This is particularly true for faculty who already have been successful in the promotion/tenure process. Colleges and schools are finding themselves in the position of continually replacing experienced practice faculty with new faculty. Finally, adding to this retention dilemma is the realization that the clinical practice pioneers of the late 1960s and early 1970s will be candidates for retirement in the next decade and will have to be replaced (Figure 4).

PRACTITIONER LIFE LONG LEARNING IN THE SCIENCES

The RGAC did not believe that AACP should establish any policy advocating for the inclusion of pharmaceutical sciences in Continuing Education (CE) programs sponsored by colleges and schools of pharmacy. Several committee members with CE experience argued that CE programs dealing with drug therapy do incorporate the pharmaceutical sciences into the programming. A more germane issue is whether the science should be presented by a non-clinical pharmaceutical scientist. There are advantages to having all pharmaceutical sciences faculty more involved in CE programs directed at pharmacy practitioners, as it contributes to the goal of having the science faculty become more familiar with the concepts of pharmaceutical care. Practice faculty are competent to present the science material supporting the practice-oriented content of most CE programs. Therefore, the decision to incorporate more pharmaceutical sciences faculty into CE programs is more a political and personal issue than a competen-

Recommendation 4: The RGAC encourages pharmacy college/school CE program sponsors to include faculty from the pharmaceutical sciences disciplines in addition to practice faculty in programs dealing with evidenced-based pharmaceutical care.

References

(20) “Preparing Future Faculty in the Professions,” Virginia Commonwealth University, www.vcu.edu/pffp.