OFFICIAL PUBLICATIONS

Education: Information Paper on Collaborative Development, Delivery, and Evaluation Pharmacy Curricula (2011)

Education: Information Paper on Collaborative Development, Delivery, and Evaluation of Pharmacy Curricula

Published by the Canadian Society of Hospital Pharmacists (CSHP), Ottawa, Ontario. 2011 edition. Use of this document was approved by CSHP Council in 2011.

Suggested citation:

Canadian Society of Hospital Pharmacists. Education: information paper on collaborative development, delivery, and evaluation of pharmacy curricula. Ottawa (ON): Canadian Society of Hospital Pharmacists; 2011.

30 Concourse Gate, Unit 3
Ottawa ON K2E 7V7
Telephone: 613.736.9733
Fax: 613.736.5660
Internet: www.cshp.ca

Education: Information Paper on Collaborative Development, Delivery, and Evaluation of Pharmacy Curricula

The pharmacy profession is responsible and accountable to society for the rational and safe use of medicines.[1] Ideally, pharmacy practitioners have the breadth of knowledge, skills, and attitudes necessary to provide high quality healthcare in all its dimensions. (This is defined by the World Health Organization as healthcare that is effective, efficient, accessible, acceptable/patient-centred, equitable, and safe.[2]) The capacity of the pharmacy profession to fulfill its mandate depends on two workforces: "an appropriately trained pharmacy workforce to provide the services and a competent and committed academic workforce to train sufficient numbers of new pharmacists and other pharmacy support staff at both basic and enhanced levels."[3] Given that the complexity of patient care can differ from one practice setting to another, the specific competencies for practice in particular settings will differ, as will the education and training required.

Over the past few decades, the focus of pharmacists' activities has shifted away from the compounding and distribution of drugs to the provision of direct patient care, both independently and within collaborative multidisciplinary teams, to the promotion of evidence-based use of medicines, and to the delivery of disease prevention and health promotion services. As the roles of pharmacists have evolved—as have the responsibilities of pharmacy technicians and assistants - so too have the educational programs supporting those roles. These practice changes make it all the more critical that all key stakeholders (including educators, regulatory authorities, accrediting bodies, voluntary pharmacy associations, employers, students, and the profession as a whole) share a clear vision of the practice of pharmacy. At present this vision is articulated in the Blueprint for Pharmacy,[4] which is a collaborative initiative led by the Canadian Pharmacists Association with the support of faculties of pharmacy, national and provincial pharmacy associations, provincial regulatory authorities, student societies, and major community pharmacy chains. Realizing this vision requires a collaborative effort of the key stakeholders to develop pharmacy practitioners for high quality practice. Furthermore, considerable planning is required to deliver and implement a progressive pharmacy curriculum that is responsive to changes in practice, research, technology, and public policy.[5]

Pharmacy education has been defined as "the educational design and capacity to develop the workforce for a diversity of settings (e.g., community, hospital, research and development, academia) across varying levels of service provision and competence (e.g., technical support staff, pharmacists and pharmaceutical scientists) and scope of education (e.g., undergraduate, postgraduate, lifelong learning)."[3] A comprehensive education is an essential component in preparing graduates to fulfill their responsibilities to society at large, with its goal to prepare practitioners who are ready to practise and to meet the needs of the people they serve. To achieve this goal it is important to align pharmacy education with the required knowledge, skills, and attitudes for current and anticipated future pharmacy practice; doing so is in the best interest of the public and is associated with many other benefits. According to the International Pharmaceutical Federation's Global Framework for Quality Assurance of Pharmacy Education, "all stakeholders who have an interest and role to play should be involved so that a profession-wide consensus and vision can be successfully articulated, pursued, and achieved"[6] throughout the process of curriculum review and renewal.

Pharmacy education comprises both didactic and experiential components.[7] The didactic portion helps the learner to acquire the knowledge, skills, and attitudes required to practise. The experiential component gives the learner the opportunity to integrate, apply, and further develop what has been learned. The didactic component is typically delivered by accredited academic programs (e.g., a university), and the experiential component typically

occurs in the practice setting (e.g., a hospital), however this is not always the case. (For example an academic program may use problem-based learning or skill-based laboratories as forms of experiential learning, and a hospital may teach by providing a lecture.) These elements of pharmacy education are interrelated; their effective integration has been associated with increased student learning.[7] For optimal outcomes, the design and delivery of each type of education takes into account what is learned in the other component. It is therefore a reasonable expectation that key stakeholders be involved, as appropriate, in designing, delivering, and evaluating pharmacy education programs.

In terms of experiential learning, academia's responsibilities in administering structured practical training programs, as part of entry-to-practice requirements, have grown over the past two decades. However, this responsibility is effectively shared with practising professionals and healthcare facilities, in that faculties of pharmacy do not have the resources to provide experiential education on their own.[8,9] At present, the experiential component is delivered largely by volunteer practising pharmacists and adjunct faculty in the healthcare setting. Substantial effort on the part of academia and experiential learning preceptors to define and carry out their respective roles and responsibilities is required to ensure that the learner has a meaningful experience while learning to apply the foundational knowledge, skills, and attitudes in the practice setting.[5] Should experiential learning requirements continue to increase, the interdependence among academia, healthcare professionals, and healthcare facilities will only grow. Hence, collaboration among key stakeholders will be essential in meeting the need for practice opportunities and in improving the quality of experiential education programs through recruitment and training of qualified preceptors and development of additional exemplary experiential education sites.[10,11]

In 2009, the Canadian Society of Hospital Pharmacists (CSHP) conducted a pan-Canadian survey of directors of hospital pharmacies to assess the capacity and willingness of hospitals to provide longer periods of experiential education or greater numbers of clinical practice opportunities. Many respondents reported that their organizations provide experiential education to student pharmacy technicians, undergraduate (baccalaureate) and graduate (masters) student pharmacists, pharmacy residents, and doctor of pharmacy students (Appendix A). Only 14% (10/72) of respondents reported a willingness to provide more or longer clinical practice rotations. The remainder of the respondents reported that their organization could not expand their programs (31/62) or were unsure if expansion was possible (31/62). Although the results of the survey are not a statistically valid sample of all Canadian hospital pharmacy directors, the results indicate the current scope of involvement by the practice sites, as well as the pressures that practitioners and their facilities are facing.

A dynamic relationship exists among practice, regulation, and education.[5] For example, changes to educational programs will require the support not only of those working in various healthcare delivery settings, but also of the healthcare organizations as a whole. Moreover, changes in a healthcare delivery setting may not be possible without appropriately trained people.[12] In addition, changes in educational programs may affect the entry-to-practice requirements set by regulatory authorities, and vice versa. As the key stakeholders play their unique role working toward a shared vision that places patients and society first, a complex interplay arises, creating interdependence among the stakeholders in the development, delivery, and evaluation of pharmacy education. Working within a construct that focuses on meeting the needs of the patient, and thus in turn the learner, the stakeholder roles and responsibilities may appear at times to overlap, yet no group is a substitute for another.

- Pharmacy regulatory authorities have a responsibility to the public through their respective provincial governments for establishing the entry-to-practice and continuing education requirements for the profession of pharmacy.
- Institutions that offer pharmacy education programs have a responsibility for graduating pharmacists and pharmacy technicians who meet a regulatory authority's requirements for entry to practice, a component of which is specified by relevant accrediting bodies. Many also have an interest in conducting research that will help to shape the practice of pharmacy as well as the associated educational programs.
- Employers require graduates of pharmacy education programs who are equipped with certain knowledge, skills, and attitudes and can transfer these directly to the workplace. The employers have a role and responsibility for providing a practice setting in which students of the pharmacy education program can further develop and apply their knowledge, skills, and attitudes as part of the educational program. They also play a role in providing up-to-date information to educational institutions about the medication-related needs of the patients and the public in their local area of responsibility.
- Pharmacists and pharmacy technicians have responsibilities, roles and concerns that are very similar to those of employers. Pharmacy practitioners have a responsibility and an interest in ensuring that graduates of a pharmacy education program are adequately equipped to care for patients. In doing so, they also participate in evaluating pharmacy education programs and in supporting the student experiential learning environment.
- Organizations that accredit pharmacy educational programs have a role in evaluating the performance of the educational organizations against the standards for specific programs.
- Students have a responsibility to strive to meet (or exceed) the entry-to-practice requirements, to develop their commitment to the practice of pharmacy and their skills for lifelong learning, and to provide feedback to pharmacy education programs.
- Professional pharmacy associations have a role in representing the interests of their members.
- Patients have a role as the recipients of the care provided by pharmacy professionals and an interest in knowing that the education their pharmacy professionals receive is of high quality and facilitates the provision of safe and effective care.
- Provincial governments have a responsibility for approving the entry to practice pharmacy curricula and any major changes in these curricula. Part of this process involves the educational institution demonstrating support from the various stakeholders that the change to the program will fulfill an unmet need.

It is incumbent on professional organizations that represent the pharmacy practitioners to work with academia and regulatory authorities to develop strategies, identify resources, and define the responsibilities of stakeholders in relation to pharmacy education and to address the various issues that may arise with curriculum development and delivery.[6,10,13] (Appendix B lists some questions that various stakeholders might ask regarding changes to pharmacy curriculum.) The involvement of all key stakeholders in the design, delivery, and evaluation of pharmacy education is intended to help increase the capacity of the pharmacy profession to fulfill its mandate to society. Working together will improve outcomes for all groups

involved in the collaborative process, and most importantly will improve the pharmaceutical services provided to the patients and the public.

LITERATURE CITED

1. Wiedenmayer K, Summers RS, Mackie CA, et al. Developing pharmacy practice: a focus on patient care: handbook. Geneva: World Health Organization; 2006 [cited 2010 Feb 22]. Available from: http://whqlibdoc.who.int/hq/2006/WHO_PSM_PAR_2006.5_eng.pdf

2. Quality of care: a process for making strategic choices in health systems. Geneva, Switzerland: World Health Organization; 2006 [cited 2010 May 20]. Available from: http://www.msc.es/organizacion/sns/planCalidadSNS/pdf/excelencia/opsc_sp6.pdf

3. Anderson C, Bates I, Beck D, et al. The WHO UNESCO FIP Pharmacy Education Taskforce 2009 [cited 2009 Aug 18]. Available from: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=19500351.

4.Task Force on a Blueprint for Pharmacy. Blueprint for pharmacy: the vision for pharmacy. Ottawa, ON: Canadian Pharmacists Association;2008.

5. Littlefield LC, Haines SA, Harralson AF, et al. Academic pharmacy's role in advancing practice and assuring quality in experiential education: report of the 2003-2004 Professional Affairs Committee. Am J Pharm Educ. 2004 [cited 2010 Jun 16]; 68(3 Suppl): Article S8. Available from: http://www.ajpe.org/aj6803/aj6803S8/aj6803S8.pdf

6. A global framework for quality assurance of pharmacy education, Version 1.0. The Hague, Netherlands: International Pharmaceutical Federation, The International Forum for Quality Assurance of Pharmacy Education; 2008 [cited 2009 Aug 18]. Available from: http://www.fip.org/education/

7. Karimi R, Arendt CS, Cawley P, et al. Learning bridge: curricular integration of didactic and experiential education. Am J Pharm Educ 2010 [cited 2010 Jun 11];74(3): Article 48. Available from: http://www.ajpe.org/view.asp?art=aj740348&pdf=yes

8. Harralson AF. Financial, personnel, and curricular characteristics of advanced practice experience programs. Am J Pharm Educ. 2003 [cited 2010 Feb 22];67(1):116-28. Available from: http://ajpe.org/aj6701/aj670117/aj670117.pdf

9. O'Sullivan T, Hammer DP, Manolakis PG, et al. Pharmacy experiential education present and future: realizing the Janus vision. A background paper. 2005 [cited 2010 Feb 23]. Available from: http://www.pubinfo.vcu.edu/pharmacy/peplibrary/resources/AACP_SummitBackgroundPaper.pdf

10. Capacity of hospitals to partner with academia to meet experiential education requirements for pharmacy students. Am J Pharm Educ 2008 [cited 2010 Feb 23]; Oct 15;72(5):117. Available from http://ajpe.org/view.asp?art=aj7205117&pdf=yes Note: A joint publication of the American Society of Health-System Pharmacists and the American Association of Colleges of Pharmacy. Also published in Am J Health Syst Pharm 2008 Nov 1;65(21):2045-6.

11. Brackett PD, Byrd DC, Duke LJ, et al. Barriers to expanding advanced pharmacy practice experience site availability in an experiential education consortium. Am J Pharm Educ 2009 [cited 2009 Sep 9];73(5): Article 82. Available from http://www.ajpe.org/view.asp?art=aj730582&pdf=yes

12. Institute of Medicine, Committee on Quality of Health Care in America. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy of Sciences; 2001.

13. FIP statement of policy on good pharmacy education practice. The Hague, Netherlands:

International Pharmaceutical Federation; 2000 [cited 2009 Aug 18]. Available from: http://www.fip.org/www/uploads/database_file.php?id=188&table_id=

Additional Reading

Canadian Society of Hospital Pharmacists. Education: statement on collaborative development, delivery, and evaluation of pharmacy curricula. Ottawa, ON: Canadian Society of Hospital Pharmacists; 2011.

American Pharmacists Association and the American Society of Health-System Pharmacists. Concerns about the accelerating expansion of pharmacy education: time for reconsideration. Bethesda, MD: American Society of Helth-System Pharmacists; 2010 [cited 2011 Feb 3] Available from: www.ashp.org/DocLibrary/News/Accelerating-Expansion-of-Pharmacy-Education.aspx

APPENDIX A: RESULTS OF 2009 SURVEY OF HOSPITAL PHARMACY DIRECTORS

In May 2009, CSHP sent an invitation to respond (within 1 week) to an online survey to managers, directors, leaders of hospital pharmacies across Canada (n=206). In all 74 respondents completed the survey. The results of the survey are not a statistically valid sample of all Canadian hospital pharmacy directors; they reflect the views of those who responded.

Demographics of respondents

Location	Responses	Percent of all respondents
British Columbia	6	8
Prairies	13	18
Ontario	33	44
Quebec	13	18
Atlantic	9	12
Total	74	100

	Single hospital (b = 41)	Multi-hospital or Regional (n = 33)
Urban	70.7%	39.4%
Rural	29.3%	18.2%
Urban & Rural	0	42.4%

Classification of hospital	Single hospital (b = 41)	Multi-hospital or Region (n = 33)
Teaching hospital(s)	34.1%	63.6%*
Community hospital(s)	65.9%	87.9%*

*Does not add up to 100% because a multihospital or region could have both teaching and community hospitals

Institutions providing experiential education in large numbers to undergraduate students and residents

Type of Student	Provide training (n= 74)	Total number /year	Average number/year /respondent	Total days/year	Average days/year /respondent
BSc pharmacists	68 (91.9%)	927	13.6	19 368	284.8
Pharm D	30 (40.5%)	165	5.5	4 300	143.3
Pharmacy Technicians	72 (97.3%)	549	7.6	9 957	138.3
Pharmacist residents	19 (25.7%)	72	3.7	18 720	985.3

Why experiential education is provided

Top 5 reasons:

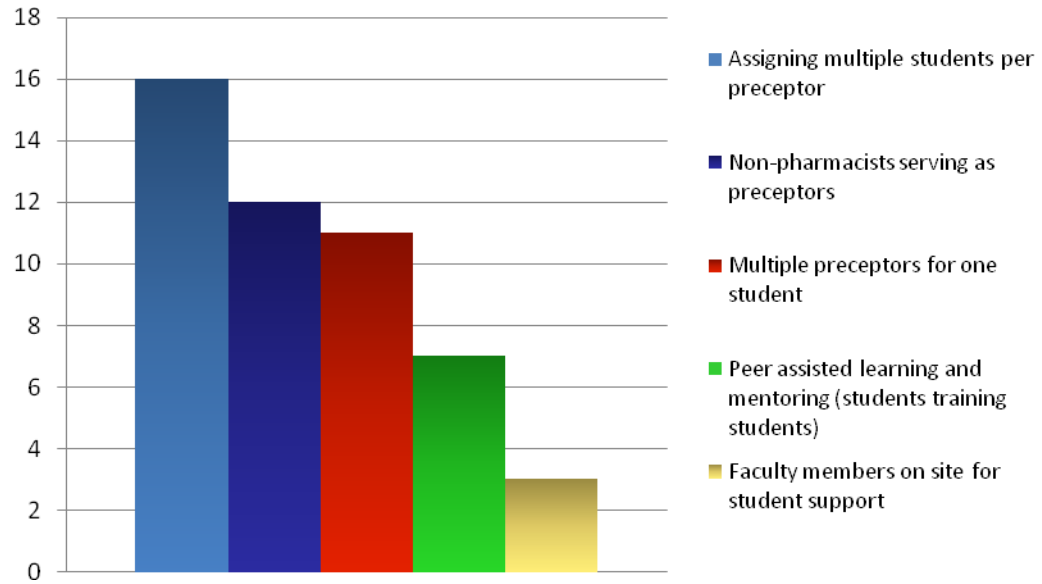
- Recruit residents or future employees for site/region
- Take an active role in training future pharmacists
- Experiential education expands the scope of pharmacist services at the institution/region
- Training is consistent with the site/region's educational mission
- Addresses the gap in "practice readiness" of new graduates

Why experiential education is NOT provided

Top 5 reasons (provided by 8 respondents):

- No staff available to coordinate rotations
- Lack of funding to provide experiential education
- Availability of pharmacist practitioners is limited (due to shortage, lack of time)
- Lack of trained or prepared pharmacist (e.g., pharmacists are not able or willing to precept)
- Academic rotation schedules are not conducive to my organization (student rotation schedule does not fit with preceptor availability)

Non-traditional training models (e.g., different than a 1 student: 1 pharmacist preceptor model) being used or attempted (n=30)



Willingness of the institution to provide longer or greater numbers of clinical practice rotations

Response	# Responses (n = 72)	Percent
Yes	10	13.9
No	31	43.1
Not sure	31	43.1

Concerns related to increased experiential demands

Top 5 concerns:

- Entry-level PharmD program putting increased workload expectations on staff
- Lack of funding to provide experiential training
- Lack of availability of pharmacist practitioners (e.g., pharmacist shortage, lack of pharmacists' time)
- Competing demands for training (e.g., demands for resident v. PharmD v. undergraduate student v. pharmacy technician student training)

Willingness to work with academic institutions to develop new innovative models of providing practice experiential training (n=72)

Response	Response rate
Yes	45 (62.5%)
No	12 (16.7%)
Not sure	12 (16.7%)

APPENDIX B: QUESTIONS THAT MIGHT ARISE IN RELATION TO CURRICULAR DEVELOPMENT AND RENEWAL

This list of questions is provided to help stakeholders anticipate the perspectives of other key stakeholders.

Questions that might be asked on behalf of the public:
a) How will the change(s) help to meet patients' needs?
b) Will the pharmacy education program produce a net gain for society (e.g., in terms of the rational and safe use of medicines and in terms of translating knowledge into practice)?
c) Will the pharmacy education program allow an increase in the number of patients who receive patient-centred care?
d) Does the pharmacy education program align with the geographic, demographic, and cultural needs of the patient communities that are to be served by its graduates?

Questions that healthcare organizations and pharmacy departments might ask:
a) How does the pharmacy education program align with the mission and vision of the hospital?
b) Does the practice setting have the capacity and infrastructure to provide an exemplary experiential educational program that will meet the needs of the pharmacy education program?
c) How can the experiential education program be integrated into the practice setting without compromising the services delivered to patients and students? Can different models be used at different locations? Will the model take into account the level of competency the students are expected to achieve at various stages in their educational program? Does the change alter the risk that either the hospital or the individual pharmacist is expected to manage?
d) What supports will be given to the preceptors to help them in adopting their new role?
e) Will changes be needed in the roles of pharmacy assistants, technicians or other support staff to facilitate more training and clinical opportunities for student pharmacists and pharmacists?
f) What level of knowledge and skills will the graduates of the pharmacy education program achieve (e.g., will the graduate be considered competent to enter practice, or proficient, or an expert)?
g) Are there incentives for staff members or the institution as a whole to support the pharmacy education program (e.g., transfer or sharing of resources, recruitment of employees, increased workforce)?
h) How will the pharmacy education program affect the health authority's ability to maintain its established ratio of pharmacists to pharmacy technicians to students, if such ratios exist in the legislative framework?
i) How will the changes be received by other healthcare disciplines, such as medicine and nursing?
j) Will the change result in the creation of fellowships or advanced residencies for graduates wishing to concentrate on specialized disciplines (e.g., cardiology, intensive care, drug information, or infectious diseases)?

Questions that student pharmacists and pharmacy residents might ask:
a) How should the hospital pharmacy residency programs be modified in response to the change in curriculum?
b) What will be the role of the residency in the new environment?
c) Will there be adequate funding to handle any increases in demand for student placements in supervised hospital-based clinical rotations or increases in enrolment in longer-term residency programs?
d) What will be the impact on student pharmacists in terms of debt load, duration of schooling, and competition for residencies?

e) Will additional sources of funding (scholarships, bursaries, grants) be made available so that the new educational programs are accessible to all Canadians?
f) How will the role of students change if the change in curriculum involves a change in the preceptor–student model? How will the students be supported in their new role, and what is their accountability to other students in the program with respect to directing and evaluating a subordinate student's performance?
g) What role will students play in how changes to curricula are made?
h) What impact will increased workload from the curricular change have on student learning and extracurricular achievement? What opportunities or flexibility will the new curriculum provide for student-driven or student-initiated learning?

Questions that academic institutions and faculties of pharmacy might ask:
a) Should other alternatives be considered? Could programs be combined or otherwise supplemented to achieve similar outcomes?
b) Will faculties work together to ensure consistency in programs (including part-time and distance programs) across the country?
c) If the change in the pharmacy education program is not implemented in all faculties of pharmacy across Canada, how will enrolment be affected in the faculties that retain their existing programs?
d) How does the change affect the required qualifications or competencies of the professionals involved in teaching and research? How will this be assessed?
e) How can faculties ensure that qualified professionals are available to serve as teachers or preceptors for students in the pharmacy education program?
f) Will the supply of experiential education practice sites match the demand?
g) How will the pharmacy education program affect the quality of teaching that the faculties can provide?
h) How will the pharmacy education program affect the number of qualified academic staff and the faculty's ability to sustain the development of a qualified workforce?
i) What types of curricular outcomes should be measured and monitored to gauge the success of the pharmacy education program?
j) Does the educational program have sufficient resources (e.g., physical infrastructure, learning and economic resources)?
k) Is there a clear distinction between the proposed program and existing programs?
l) What is the potential effect on the role and mission of the academic institution?

Questions that pharmacy regulatory authorities might ask:
a) Will entry-to-practice requirements change?
b) Will the structured practical experiential program change?
c) Will the pharmacy education program produce a net gain for society (e.g., in terms of the rational and safe use of medicines and in terms of translating knowledge into practice)?
d) Should legislative changes to redefine pharmacists' scope of practice be pursued?

Questions that pharmacy practitioners (and voluntary pharmacy organizations) might ask:
a) How will the revised pharmacy education program change the practice of pharmacy?
b) Will pharmacy practitioners be provided an opportunity to upgrade their education, knowledge, or skills with the introduction of the curricula?

c) How will pharmacy practitioners be involved in training students in the new pharmacy education program?
d) How will the pharmacy education program align with the practice activities expected of pharmacists?
e) How will the pharmacy program be made accessible to persons in remote or rural areas?
f) How does the change affect the mobility of pharmacy practitioners working in other provinces or territories in Canada?
g) Do the changes to the curriculum accurately reflect the community of pharmacist practitioners and their roles throughout the continuum of care, in various settings?
h) How will the changes support the student's understanding of the roles of pharmacy practitioners in the healthcare system?
i) How will changes to the preceptor–student model affect the roles and responsibilities of these individuals? How will preceptors be supported in their role?

Questions that non-pharmacy healthcare professionals might ask:
a) How will these changes affect other healthcare disciplines, such as medicine and nursing? What types of background information do other healthcare professionals need to reduce potential confusion about role expectations, professional responsibilities, and the development of collaborative working relationships?
b) Does the curriculum align with the curricula of other healthcare professionals?
c) Are there opportunities for students to learn from, and with, other healthcare professionals? How can the academic institutions promote and foster this?
d) How can the education of other healthcare professionals be supported through the proposed pharmacy education program, both in the classroom and in practice settings?

Bibliography
(For Appendix B)

A global framework for quality assurance of pharmacy education, Version 1.0. The Hague, Netherlands: International Pharmaceutical Federation, The International Forum for Quality Assurance of Pharmacy Education; 2008 [cited 2009 Aug 18]. Available from: http://www.fip.org/education/.

American Association of Colleges of Pharmacy, & Academic Practice Partnership Initiative. (June 17 - 18, 2005). Final report and proceedings. Paper presented at the Summit to Advance Experiential Education in Pharmacy, Chicago, Illinois. [cited 2010 Feb 22]. Available from: http://www.aacp.org/resources/education/APPI/Documents/SummitFinalReport.pdf

Anderson C, Bates I, Beck D, et al. The WHO UNESCO FIP Pharmacy Education Taskforce. Hum Resour Health (2009).[cited 2009 Feb 18]. Available from: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=19500351

Bauman JL, Evans WE. Pharm.D.-only investigators are critical to the profession: let's preserve the fellowship as an equally important way to prepare future clinical pharmaceutical scientists: or the case against the "all-Ph.D.". Pharmacotherapy 2009 Feb;29(2):129-33.

Brackett PD, Byrd DC, Duke LJ, et al. Barriers to expanding advanced pharmacy practice experience site availability in an experiential education consortium. Am J Pharm Educ 2009 [cited 2009 Sep 9];73(5): Article 82. Available from http://www.ajpe.org/view.asp?art=aj730582&pdf=yes

Brodie DC. Trends in pharmaceutical education. Am J Nurs 1968 Sep;68(9):1948-51.

Capacity of hospitals to partner with academia to meet experiential education requirements for pharmacy students. Am J Pharm Educ 2008 [cited 2010 Feb 23]; Oct 15;72(5):117. Available from http://ajpe.org/view.asp?art=aj7205117&pdf=yes Note: A joint publication of the American Society of Health-System Pharmacists and the American Association of Colleges of Pharmacy. Also published in Am J Health Syst Pharm 2008 Nov 1;65(21):2045-6.

Dowling TC, Murphy JE, Kalus JS, et al. Recommended education for pharmacists as competitive clinical scientists. Pharmacotherapy 2009 Feb;29(2):236-44.

Final report of the Summit to Advance Experiential Education in Pharmacy" held June 17-18, 2005, Chicago, Illinois

FIP statement of policy on good pharmacy education practice. The Hague, Netherlands: International Pharmaceutical Federation; 2000 [cited 2009 Aug 18]. Available from: http://www.fip.org/www/uploads/database_file.php?id=188&table_id=

Harralson AF. Financial, personnel, and curricular characteristics of advanced practice experience programs. Am J Pharm Educ. 2003 [cited 2010 Feb 22];67(1):116-28. Available from: http://ajpe.org/aj6701/aj670117/aj670117.pdf

Pharm Educ. 2003 [cited 2010 Feb 22];67(1):116-28. Available from: http://ajpe.org/aj6701/aj670117/aj670117.pdf

Institute of Medicine, Committee on Quality of Health Care in America. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy of Sciences; 2001.

Littlefield LC, Haines SA, Harralson AF, et al. Academic pharmacy's role in advancing practice and assuring quality in experiential education: report of the 2003-2004 Professional Affairs Committee. Am J Pharm Educ. 2004 [cited 2010 Jun 16];68(3 Suppl): Article S8. Available from: http://www.ajpe.org/aj6803/aj6803S8/aj6803S8.pdf

O'Sullivan T, Hammer DP, Manolakis PG, et al. Pharmacy experiential education present and future: realizing the Janus vision. A background paper. 2005 [cited 2010 Feb 23]. Available from: http://www.pubinfo.vcu.edu/pharmacy/peplibrary/resources/AACP_SummitBackgroundPaper.pdf

Wiedenmayer K, Summers RS, Mackie CA, et al. Developing pharmacy practice: a focus on patient care: handbook. Geneva: World Health Organization; 2006 [cited 2010 Feb 22]. Available from: http://whqlibdoc.who.int/hq/2006/WHO_PSM_PAR_2006.5_eng.pdf