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INTERPROFESSIONAL EDUCATION SUPPLEMENT

Keys to Successful Implementation of Interprofessional Education: Learning Location, Faculty Development, and Curricular Themes

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Although there is evidence to support implementing interprofessional education (IPE) in the health sciences, widespread implementation in health professions education is not yet a reality. Challenges include the diversity in location and settings of schools and colleges, ie, many are not located within an academic health center. Faculty members may not have the necessary skill set for teaching in an IPE environment. Certain topics or themes in a pharmacy curriculum may be more appropriate than others for teaching in an IPE setting. This paper offers solutions to teaching IPE in diverse settings, the construct for implementing a faculty development program for IPE, and suggested curricular topics with their associated learning objectives, potential teaching methods, and timelines for implementation.

Keywords: interprofessional education, faculty development, curriculum

INTRODUCTION

The fundamental premise of interprofessional education (IPE) asserts that if health professions students learn together at the beginning of and throughout their training they will be better prepared to deliver an integrated model of collaborative clinical care after entering practice. Accordingly, IPE has been identified as integral in the education of pharmacy students both by the American Association of Colleges of Pharmacy and the Accreditation Council for Pharmacy Education. While there may be support by the profession to adopt IPE as an important pedagogy, certainly there are challenges and barriers to this effort. Before IPE can be initiated at any institution, a systematic planning, development, and implementation process should be outlined including a plan for faculty and curricular development. The goals of this review are twofold: (1) to provide pharmacy educators with a structural framework and building blocks for the development of IPE activities, and (2) to present the elements related to faculty development necessary for successful implementation of IPE activities.

The development and implementation of IPE experiences can present challenges including (1) the diversity of the mission and goals of the school or college, (2) the type of institution and settings where the school or college is located, and (3) the availability of other institutions and organizations outside the university where the school or college is located. The framework for the desired learning outcomes for the doctor of pharmacy degree are provided in the Accreditation Council for Pharmacy Education Standards 2007.[1] These standards may guide the development and implementation of IPE in the context of a school or college's unique academic environment.

The first goal of this work was to differentiate and characterize the different educational environments where our schools/colleges are located. Five different models relevant to contemporary pharmacy education are proposed as frameworks to consider in the development and implementation of IPE activities. For example, only 31 of the current schools and colleges of pharmacy in the United States are located in an academic health center. The types of activities available to schools and colleges

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will be dependent upon what other health care educational programs exist within the university and/or the availability of other health care organizations in the area or region. The structural blocks for IPE are achieved by identifying and partnering with the available learning opportunities and locations in other health care educational programs and/or health care organizations; this represents a key first step for IPE activities. This work provides possible partners and locations as a function of the 5 models (described later) to assist faculty members and schools and colleges to develop their IPE experiences.

Faculty development is a key element in the development of IPE.[2] Simply bringing faculty members from different health care disciplines into the same classroom, laboratory, simulation center, patient care facility, or other learning environment should not be assumed to result in a beneficial IPE experience for health care students. It becomes essential for colleges and schools of pharmacy, in conjunction with other health care educators and health care partners, to put into practice the faculty and clinician development programs and systems in various institutions/organizations focusing on (1) key elements underlying the purpose and goals of IPE activities, (2) ideal attributes and characteristics of IPE educators/clinicians, and (3) educational competencies, components, and activities for successful IPE. The development of skilled educators is an evolutionary process and should be based on the premise of educating collaborative, reflective practitioners capable of functioning effectively in an interprofessional healthcare team.

DIVERSITY OF INTERPROFESSIONAL EDUCATION MODELS

A critical element of IPE is the availability of partners and settings that would enable opportunities for health professional students to engage in learning opportunities that affect their behavior in clinical situations. The nature and structure of these interactions and the partners involved in this process are varied based upon the model of pharmacy program:

(1) School/college of pharmacy is in a fully integrated academic health center (eg, University of Cincinnati);
(2) School/college is partially co-located program (ie, within the same region) with pharmacy and other professions under a common university ownership (eg, University of Connecticut);
(3) School/college is partially co-located program with pharmacy and other professions under different university components (eg, University of Texas);
(4) School/college with other health professions but no medical school (eg, Butler University);
(5) School/college with no other health education programs on campus (eg, Albany College of Pharmacy).

Interprofessional education usually involves educators and learners from 2 or more health professions and the nature of interactions should be focused on the learner with the educational goal of providing the knowledge, skills, and attitude/values focused on patient-centered care. Certainly, there are a variety of partners for schools and colleges located in a university with a fully integrated academic health center or in a university with a co-located health education program. Identification of available partners for schools and colleges without medicine but with other health care disciplines or those standalone schools without other healthcare professionals can be more challenging, but is not impossible if one considers other resources in the community and/or alternative approaches to provide learning opportunities. Individual schools and colleges should examine their university as well as surrounding colleges, practice sites, and community resources for potential collaborators for IPE.

Needs for each school/college may vary based on the organizational model, health professions available, and collaborative interest in IPE. IPE partnerships will occur most innately with those within the same university system (Types 1, 2, and 4) and between pre-established relationships with other healthcare education programs and practice settings. Schools without health professions co-located on their campus (Types 3 and 5) are likely to have the most difficulty and will require individual and creative approaches to implement IPE, especially in the didactic curriculum. These colleges may need to create new partnerships with other institutions of higher education that may or may not be in the same geographic location. While live face-to-face interaction is optimal, successful IPE learning opportunities could occur through technology with students at different locations. A list of possible partners for these various types of schools and colleges is provided in Table 1. These should be considered as potential partners and learning locations for interprofessional education; however, the list is not all inclusive and a school or college may partner with any profession related to patient care and in any location that supports interaction between professions.

LEARNING OPPORTUNITIES AND LOCATIONS

A successful IPE learning opportunity should be a planned experience for all learners. It can include didactic instruction with or without a clinical experience,

but it must be an intervention to assist the transformation of learners' attitudes, knowledge, skills, or behavior related to interprofessional care.[3] In addition, an ideal intervention must include the opportunity for the students to perform some type of reflection as to their initial and changed perception of their role and value in interprofessional care. Students should receive feedback on their ability to reflect on their practice.[4] Learning opportunities should be optimized to accommodate the programs of the various partners engaged in IPE; although, not every profession has to be involved in every IPE opportunity offered. This can be one of the greatest challenges, given the differences often seen among health education program structures (eg, curricular organization, semester or quarter schedule) and the difficulties encountered in working across administrative units or between different institutions to establish the necessary affiliation agreements.

Learning opportunities should be developed based upon the agreed learning outcomes for the students in the programs. A series of well-constructed and agreed upon outcomes incorporating knowledge, skills, attitudes, and behaviors will serve as the foundation for the development of the specific learning activities or approaches. It will also form the basis for the development of the requisite learning assessments.

In addition to traditional hospital or clinic settings, possible learning locations include campus simulation centers, student health centers, or hospices or palliative care centers (Table 1). Certainly, the large classroom may be the location that is simplest and easiest to schedule for IPE. The essential element in any learning location must be that the site provides an environment for the team—learners and educators—to be engaged collaboratively and focus on the elements needed for interprofessional care. Careful consideration must be taken in deciding the timing and place of these learning locations in order to accommodate as many sets of learners as possible. These IPE experiences do not have to be offered in the traditional quarter or semester structure with weekly meetings. Instead, they could be conducted in a condensed time (eg, 1 or more weeks) throughout the academic year or even during the summer rather than over the course of an academic year. An intensive IPE experience (independent of other curricular requirements) could complement student learning conducted earlier in the semester or at the end of the academic year, which would enable the learner to focus on the critical elements in an IPE experience. A learning location must set all the participants on an equal footing, which is particularly important in the beginning of these experiences. Orienting all the learners to the location utilizing a team approach and allowing time for the IPE teams to form must be included in the learning opportunity. It may require several sessions for the IPE teams to start functioning collaboratively and there must be feedback to the learners as to the success and growth of their IPE teams.

Regardless of organization model, all colleges of pharmacy have some common needs and must confront several key issues to be successful in mounting an effective IPE component to their programs. Faculty members and students should appreciate the salience of IPE and its importance in the improvement of health care delivery and patient safety. Significant faculty and technological resources will be necessary for IPE implementation. Successful IPE implementation requires both faculty and administrative support. In this vein, administrative issues (including promotion and tenure) need to be aligned with changes that accompany IPE to enhance the potential for faculty buy-in. Finally, new IPE teaching and practice models need experimentation and evaluation.

FACULTY DEVELOPMENT

The AACP 2006-2007 Professional Affairs Committee identified that faculty development activities at the campus level are essential to the success of any IPE program. The Committee recommended AACP identify and share best practices in faculty development through its meetings, publications, and programs.[5] Subsequently, the AACP Interim Meeting in February 2008 dedicated its keynote address to IPE and convened leaders of the other health professions organizations to share their perspectives on education and practice.[6]

Planning and developing an IPE course can be different in many ways from a course offered to only one profession. IPE can take a considerable amount of resources and time, reportedly requiring 3 times the preparation of a traditional course. To optimize the potential for a successful IPE initiative, the faculty members involved need initial preparation and continual development in this area.[2] Historically, faculty members have not been trained to teach before being hired as educators; instead, they teach in ways similar to how they were taught, learn on the job, and/or grow through faculty development programs.

Implementing a Faculty Development Program

IPE is an enormous undertaking and there are tools faculty members can use to get started in and stay current with the field of IPE in the health professions. IPE faculty development should be initiated before the educational process begins. Faculty members must view faculty development as a vital component of IPE and not an added responsibility. In addition, faculty development affords

Table 1. Partners/Locations for IPE as Function of Pharmacy School/College Models

Pharmacy Program in a Fully Integrated Academic Health Center	Pharmacy Program Partially Co-Located Under a Common University Ownership	Pharmacy Program Partially Co-Located Under Different University Components	Pharmacy Program With Other Health Care Disciplines but No Medical School	Pharmacy Program With No Other Health Education Program on Campus
PARTNERS				
• Medicine	• Medicine	• Medicine	• Dentistry	• Social Work
• Dentistry	• Dentistry	• Dentistry	• Nursing	• Exercise Science
• Nursing	• Nursing	• Nursing	• Physical Therapy	• Nutrition
• Physical Therapy	• Physical Therapy	• Physical Therapy	• Occupational Therapy	• Seminary Programs
• Occupational Therapy	• Occupational Therapy	• Occupational Therapy	• Physician Assistant	
• Physician Assistant	• Physician Assistant	• Physician Assistant	• Optometry	
• Optometry	• Optometry	• Optometry	• Podiatry	
• Podiatry	• Podiatry	• Podiatry	• Social Work	
• Social Work	• Social Work	• Social Work	• Exercise Science	
• Exercise Science	• Exercise Science	• Exercise Science	• Nutrition	
• Nutrition	• Nutrition	• Nutrition	• Seminary Programs	
• Seminary Programs	• Seminary Programs	• Seminary Programs		
LEARNING LOCATIONS				
• Academic Health Center Clinic or Hospital	• Academic Health Center Clinic or Hospital	• Academic Health Center Clinic or Hospital	• Off-Site Clinics	• Off-Site Clinics
• Off-Site Clinics	• Off-Site Clinics	• Off-Site Clinics	• Campus Patient Simulation Center	• Campus Patient Simulation Center
• Campus Patient Simulation Center	• Campus Patient Simulation Center	• Campus Patient Simulation Center	• Campus Student Health Center	• Campus Student Health Center
• Campus Student Health Center	• Campus Student Health Center	• Campus Student Health Center	• Community Health Centers	• Community Health Centers
• Community Health Centers	• Community Health Centers	• Community Health Centers	• Community Church Center	• Community Church Center
• Community Church Centers	• Community Church Center	• Community Church Center	• Private Group or Individual Practices	• Private Group or Individual Practices
• Private Group or Individual Practices	• Private Group or Individual Practices	• Private Group or Individual Practices	• Mental Health Facilities	• Mental Health Facilities
• Mental Health Facilities	• Mental Health Facilities	• Mental Health Facilities	• Hospice or Palliative Care Centers	• Hospice or Palliative Care Centers
• Hospice or Palliative Care Centers	• Hospice or Palliative Care Centers	• Hospice or Palliative Care Centers	• Classrooms or Laboratory	• Classrooms or Laboratory
• Classrooms or Laboratory	• Classrooms or Laboratory	• Classrooms or Laboratory	• Clinics in Local School Systems	• Clinics in Local School Systems
• Clinics in Local School Systems	• Clinics in Local School Systems	• Clinics in Local School Systems		

faculty members from multiple disciplines the opportunity to interact early in the process of initiating IPE, while they are learning these skills together and forming team bonds. Typically, faculty members will start by duplicating the way they teach in their discipline of origin. Since different professions may have characteristic ways of teaching and learning, faculty members are likely to have internalized preferences for how they teach and interact

with students. Likewise, a group of faculty members may bring their individual expectations of how the teaching will occur.[2] Thus, it is essential that these experiences be shared among the faculty teams so that optimal strategies can be agreed upon.

Considerations in Implementing a Faculty Development Program for IPE

Professional development in IPE teaching is necessary due to certain issues related to this area. Faculty members often are skeptical about the value and benefit of IPE. Only recently has the effectiveness of IPE been documented.[3,7,8] Educators also need to feel confident and secure about their knowledge base and sure of their ability to facilitate diverse groups of interprofessional learners. It is important for faculty to learn through the process of faculty development that teaching in an IPE environment is a shared responsibility. Additionally, as faculty members learn to work together to plan, develop, implement, teach, and evaluate courses and student performance, they serve as critical role models to the health professions students in their classes.[2]

Faculty members teaching in an interprofessional environment need to have the knowledge, skills, and values to successfully teach in this unique setting. Instead of teaching in a ''silo,'' faculty members will teach side by side with others who they may not know and will need to have the skills to adapt to both their colleagues and student participants. The healthcare system has a historical hierarchy among healthcare professionals that may yield power struggles when planning and teaching an interprofessional curriculum. Although we can assume that faculty members will have pertinent skills and knowledge in teaching, they may not have the skills necessary to perform IPE adequately.[2]

A starting point for faculty development in IPE is to identify the needs of the faculty members involved. Table 2 lists the ideal attributes/characteristics of interprofessional educators. Most faculty members will not be fully accomplished in all of the areas listed, and there may be common gaps or holes that many faculty members need to further develop. Common areas of faculty development for IPE include interactive teaching and learning, facilitated learning, group dynamics, conflict resolution, technology, working with unenthusiastic learners, and assessment strategies for IPE.[2]

Competencies for faculty members involved in interprofessional teaching are similar to competencies for students. Student competencies center on team organization and function; assessment and optimization of team performance; intrateam communication; conflict resolution and consensus building; leadership; and ability to set common patient care goals. Competencies for interprofessional teaching should include a commitment to IPE, understanding of roles and responsibilities in the different professions, positive role modeling, group dynamics, expert facilitation, valuing diversity, ability to use professional differences creatively within groups, and a deep understanding of and skill in using active learning methods.[2,9]

Becoming a skilled educator in IPE is an evolutionary process. First and foremost, faculty members need to have a shared understanding of the purpose and goals of IPE. It is also critical to engage in collaborative discussion regarding the pedagogical approach to IPE. Ultimately, development will occur through teaching in an IPE environment, critical reflection on the success and difficulties in the IPE setting, and making the necessary adjustments to improve the teaching. There are many resources to assist with faculty development in this area (Appendix 1).[2,10-21] Most notably, the Agency for Healthcare Research and Quality (AHRQ) has developed a train-the-trainer system aimed at improving teamwork skills among health care professionals with the resulting educational goal of improving patient outcomes. The program includes extensive training materials (eg, preceptor guide, multimedia resource kit, and PowerPoint presentations) aimed at integrating principles of teamwork into a health care system. These resources can readily be adapted for team training of health professions education students in IPE. The examples and videos mimic real-world scenarios in which recommended communication tools can be utilized and evaluated in an IPE setting. This approach will help students see the immediate application of what they are learning.[19] Appendix 2 outlines journal articles that are considered either best practice examples or helpful articles of interest for those initiating an IPE program at their university, academic health care center, or other academic setting.[3,22-36]

DISCIPLINE-INDEPENDENT CURRICULAR ELEMENTS IN IPE

Many IPE articles describe the development, process, and/or function of healthcare teams in the educational setting.[28,33,34] Some articles discuss success or barriers in the implementation of a specific course or curricular topic.[23,36] However, few IPE articles provide a menu of various curricular topics that could be considered for IPE. Potential topics ideally suited for IPE are listed in Table 3.

Regardless of the curricular topic chosen for IPE, we believe it should reflect the primary goal of IPE by developing a collaborative, reflective practitioner capable of functioning effectively in an interprofessional healthcare team. The topic should encourage critical thinking, self-assessment, and reflection. Additionally,

Table 2. Ideal Attributes/Characteristics of Interprofessional Educators[2]

- Group facilitation experience
- Team teaching experience
- Pragmatic expectations of interprofessional learning
- Skilled in helping groups through conflict
- Expertise in the competencies needed for practice in the setting
- Capable of helping learners connect theory to practice
- Practiced in helping student overcome miscommunication that may arise from different professions' perspectives
- At ease with the technology and learning methods being used (e.g. problem based learning, active learning)
- Accomplished in developing targeted assessments and providing specific and sensitive feedback
- Engages in critical reflection on interprofessional teaching and implements changes in the process

the curricular topic should reflect some if not all of the 5 core competencies outlined by the Institute of Medicine: deliver patient-centered care, work as part of an interprofessional team, emphasizing evidence-based practice, focus on quality improvement approaches, and use information technology.[37] Six specific topics, which lend themselves to IPE and the IOM criteria, are described in Appendix 3 with proposed learning objectives, teaching methods, and implementation timelines for pharmacy curricula.

SUMMARY

The value of IPE has been clearly outlined by the IOM and relevant literature. Educating health professions students in an interprofessional environment can lead to effective interprofessional health care teams, thus reducing medical errors and improving patient outcomes. Accreditation standards for pharmacy now include IPE as a recommended component of the curriculum and other health professions may soon follow. It is important to include certain critical elements when implementing IPE at any institution. Although schools and colleges at major academic health centers may have other professions readily available with whom to collaborate, IPE can be implemented at any school or college. Several curricular topics have been outlined that are best suited for IPE in health professions education and it may be easiest to begin with one of these. Most importantly, the IPE initiative should be evaluated and outcomes of the venture should be shared in a scholarly manner.

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Table 3. Potential Curricular Topics for Interprofessional Education.

- Adherence and Persistence (including behavioral modification and medication therapy)
- Biomedical and Clinical Sciences (ie, pathophysiology, pharmacology)
- Care for Patients with Acute Illnesses
- Care for Patients with Chronic Illnesses
- Communication Skills (including both provider-to-patient and provider-to-provider skills, health literacy)
- Contemporary Health Care Systems (including the economics of health and medicine)
- Cultural Awareness and International Health
- Elements and Dynamics of Patient Management (including electronic/informatics)
- Emergency Preparedness (including bioterrorism, natural disasters, CPR, ACLS)
- Evidence-based Medicine (including clinical research methods, biostatistics, literature evaluation)
- Professional Ethics
- Public Health (including nutrition, health promotion and disease prevention)
- Quality Assurance and Patient Safety
- Special Patient Populations (eg, patients with disabilities, underserved populations, palliative care, rural populations, patients with HIV/AIDS, and mental illness)
- Interprofessional Team Roles, Responsibilities, and Professionalism (including value of each profession, professionalism, team building, conflict negotiation)

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Appendix 1. Faculty Development Resources in Interprofessional Education [2,10-21]

Title of Resource	Type of Reference	Summary
CAIPE – UK Centre for the Advancement of IPE (CAIPE 2008)[10]	Web site www.caipe.org.uk	IPE resource for both the university and workplace settings across health and social care. CAIPE provides IPE information, examples of good practices, opportunities to exchange experiences, programs (conferences, workshops, & seminars), access to relevant research, and responses to policy documents
Canadian Interprofessional Health Collaborative (CIHC 2008)[11]	Web site www.cihc.ca	Informational website which seeks to identify and share best practices in IPE and collaborative practice.
Center for Health Sciences Interprofessional Education: Interprofessional Patient Safety Education and Resources (Center for Health, 2008)[12]	Web site http://interprofessional.washington.edu/ptsafety/default.asp	Teaching resources for interprofessional education about patient safety. Included within this website is information about The Agency for Health Care Research & Quality that has developed a resource for case studies and forum on patient safety and health care quality. This site features case studies, interactive learning modules, and online discussion forums.
CIHC IPE & Core Competencies Literature Review (CIHC Lit Review)[13]	Publication	Provides review of IPE definitions, IPE around the world, core competencies, universities implementing IPE, and review of evidence for IPE.
Effective Interprofessional Education: Development, Delivery & Evaluation[2]	Book	Focuses on the initial development of IPE. Issues related to laying the groundwork, developing the curriculum, faculty development, and evaluating the effectiveness of the program are included.
Effective Interprofessional Education: Argument, Assumption & Evidence[14]	Book	Contains a systematic review of evidence on the use of IPE to inform teaching, research and program planning. Reviews lessons learned from the use of IPE, barriers to address, and attempts to answer gaps in knowledge about IPE.
Health Canada: Interprofessional Education for Collaborative Patient-Centred Practice Research Synthesis Paper[19]	Web site http://www.hc-sc.gc.ca/hcs-sss/hhr-rhs/strateg/interprof/index_e.html.	Describes in detail the resources needed when considering the pursuit of interprofessional education. "The purpose of this paper is to summarize the main themes emerging from the research report and discussion papers which have been commissioned to date as part of the IECPCP initiative." Helpful for those who are initiating IPE.
Journal of Interprofessional Care[16]	Journal http://www.tandf.co.uk/journals/titles/13561820.html	Journal published every other month dedicated to the dissemination of experience, policy, research evidence and theoretical and value perspectives informing collaboration in education, practice and research between medicine, nursing, veterinary science, allied health, public health, social care and related professions to improve health status and quality of care for individuals, families and communities.
Prevention Education Resource Center (PERC)[17]	Website http://www.teachprevention.org/interprofessional.php	Interprofessional education website that includes a link to interprofessional teaching resources for a prevention curriculum that includes the curriculum framework and materials.
UMDNJ Center for Teaching Excellence: Clinical Education: Team/Interdisciplinary Teaching[18]	Website http://cte.umdnj.edu/clinical_education/clined_interdisciplinary.cfm	Comprehensive resources that provides 24 links to Universities, national and international groups, and key articles that describe various frameworks for setting up interdisciplinary teaching. Valuable resources for those actively teaching in an IPE setting.
TeamStepps: Strategies and Tools to Enhance Performance and Patient Safety[19]	Website, training materials http://www.ahrq.gov/qual/teamstepps	Training system developed by AHRQ designed to optimize patient outcomes by improving communication and other teamwork skills among health care professionals. TeamStepps includes ready-to-go training materials to help educate health care professional students regarding teamwork. Educator can receive 1 copy of training materials for free.
The Case for Interprofessional Collaboration: In Health and Social Care[20]	Book	This book presents the case for interprofessional collaboration at the practice level. The need for positive professional relationships in health systems as a means to improve patient care is explored. The theory of collaboration and how to develop collaborative relationships in practice is reviewed. How policy affects the ability to work interprofessionally is discussed.
The International Association for Interprofessional Education and Collaborative Practice[21]	Website http://www.interedhealth.org	North American organization for interprofessional education. Can join as a member.

Appendix 2. Best Practices and Articles of Interest on Interprofessional Education[3,22-36]

Article	Relevance
Banks S, Janke K. Developing and implementing interprofessional learning in a faculty of health professions. *J Allied Health.* 1998;27(3):132-136. [23]	Best practice example of a didactic interprofessional curriculum for 8 health professions. Focuses on the first module of professional ethics. Includes evaluation by students.
Barrett, G., Greenwood, R., & Ross, K. Integrating interprofessional education into 10 health and social care programmes. *J Interprof Care*. 2003;17(3): 293-301.[24]	Based on experience of developing interprofessional program of 10 different professions. Highlights challenges encountered, how to create interprofessional student groups, development of scenarios, and integration throughout program (not silo). Logistical barriers are well-outlined.
Cooper, H et al. Developing an evidence base for interdisciplinary learning: a systematic review. *J Adv Nurs*. 2001;35:867-85.[25]	This is an analysis of the existing literature and application to their particular situation.
D'Eon, M. A blueprint for interprofessional learning. *Med Teach* 2004;26(7):604-9.[26]	Great foundation for the topic. Includes educational psychology principles, pedagogy and defines key terms.
Freeth D, Nicol M. Learning clinical skills: an interprofessional approach. *Nurs Educ Today*. 1998;18:455-61.[27]	Describes actual attempt of common skill training between nursing and medical students using a Clinical Skills Center. Interesting descriptions and insights into the processes involved and the students' attitudes.
Gilbert JH. Interprofessonal learning and higher education structural barriers. *J Interprof Care* 2005;19(Suppl 1):87-106.[28]	Discusses barriers to interprofessional education and offers suggestions for how to overcome these challenges.
Gordon PR, Carlson L, Chessman A, et al. A multisite collaborative for the development of interdisciplinary education in continuous improvement for health professions students. *Acad Med* 1996;71(9):973-8.[29]	In 1994, The Institute for Healthcare Improvement formed the Interdisciplinary Professional Education Collaborative (the Collaborative). The mission of the Collaborative is to create an interdisciplinary teaching and learning environment in which future health professionals learn to work together to improve health care delivery. Apart from emphasizing interdisciplinary collaboration, the Collaborative focuses on teaching the methods of continuous improvement (CI). The Collaborative consists of four local interdisciplinary teams (LITs). This paper describes each LIT's approach to achieving the Collaborative's commitment to give health professions students the opportunity to work in interdisciplinary teams to learn about and practice CI methods, training the Collaborative believes will enable them to be effective providers in a variety of health care systems. The overall goals of the Collaborative are described, reports from the four LITs are presented, and common lessons learned are discussed.
[a] Hope, J. M., Lugassy, D., Meyer, R., Jeanty, F., Myers, S., & Jones, S. et al. Bringing interdisciplinary and multicultural team building to health care education: The downstate team-building initiative. Acad Med. 2005;80(1):74-83.[30]	Best practice example of a didactic program for 7 health disciplines. This article evaluated the impact of the Downstate Team-Building Initiative (DTBI), a model multicultural and interdisciplinary health care team-building program for health professions students involving 65 in 7 health disciplines. It also describes Tuckman's four team development stages (forming, storming, norming, performing). The DTBI successfully united students across health discipline, ethnicity, socioeconomic class, gender, and sexual orientation into functioning teams. The model represents an effective approach to teaching health care team building and demonstrates benefits in both preclinical and clinical years of training. Focuses on group development. Includes extensive evaluation of outcomes.
Horsburgh M, Lamdin R, Williamson E. Multiprofessional learning: the attitudes of medical, nursing and pharmacy students to shared learning. *Med Educ*. 2001(9);35:876-883.[31]	New Zealand paper that evaluate a survey given to all 3 professions' first year students. Good look at attitudes and the survey instrument is printed in full and could be readily used by all.
Johnson, A. W., Potthoff, S. J., Carranza, L., Swenson, H. M., Platt, C. R., & Rathbun, J. R. CLARION: A Novel Interprofessional Approach to health Care Education. *Acad Med.*2006;81(3):252-256.[22]	The Clinician/Administrator Relationship Improvement Organization is a student-driven organization that was developed at the University of Minnesota in order to facilitate interprofessional training among health science students. This article was written by former executive board members for the organization in order to provide other universities of how this organization was developed and what the impact has been since it was created. The organization began as a one day retreat for students and faculty to discuss frustrations, and it has grown since its inception and now entails an annual Interprofessional Case Competition. This requires that an interprofessional student group work together for 6 weeks prior to the competition on a root-cause analysis and then present their findings in front of evaluators to determine a winner.
Lindeke, L. L., Ernst, L., Propes, B., Edwardson, S., Lepinski, P., & Ardito, S. et al. A model of interdisciplinary education for inner-city health care. *Nat Acad Pract Forum*. 1999;1(2): 95-98.[32]	Best practice for program that combines academic-community partnership as well as interprofessional connectivity. Program incorporates didactic, clinic and project-based experiences.
[a] Oandasan I, Reeves S. Key elements for interprofessional education. Part 1: the learner, the educator and the learning context. *J Interprof Care*. 2005;19(Suppl 1):21-38.[33]	This paper is the first of two that highlights key elements needed for consideration in the planning and implementation of interprofessional educational (IPE) interventions at both the pre and post-licensure qualification education levels. Part 1 of this series discusses the learning context for IPE and considers questions related to the "who, what, where, when and how" related to IPE. Through a systematic literature review, this paper provides background information that can be helpful for those involved in an interprofessional initiative.
[a] Oandasan I, Reeves S. Key elements of interprofessional education. Part 2: factors, processes and outcomes. *J Interprof Care*. 2005;19 (Suppl 1):39-48.[34]	In the second paper of this two part series on Key Elements of Interprofessional Education (IPE), factors for success are highlighted. The paper initially discusses micro (individual level) meso (institutional/organizational level) and macro (socio-cultural and political level) factors that can influence the success of an IPE initiative. The discussion provides the infrastructure for the introduction of a proposed framework for educators to utilize in the planning and implementation of an IPE program to enhance a learner's opportunity to become a collaborative practitioner. The paper also discusses key issues related to the evaluation of IPE and its varied outcomes. Lastly, it gives the reader suggestions of outcome measurements that can be used within the proposed IPE framework.
Remington, T. L., Foulk, M. A., & Williams, B. C. Evaluation of Evidence for Interprofessional Education. *Am J Pharm Educ*. 2006;70 (3), Article 66.[3]	This review sought to summarize the current literature on interprofessional education so that clinician educators can use the results to help with the process of developing interprofessional courses and determine what educational interventions improve learner-based outcomes. The results from this review demonstrate that interprofessional education will likely enhance learners' short-term knowledge and attitudes, but little evidence exists for persistent improvement or behavioral change among learners. The author's extensive literature search produced 13 relevant studies, that although were not of high methodological quality, generally positive results were noted in all studies. This review highlights the importance of interprofessional education and the lack of evidence to support their implementation into many curricula and emphasizes the need for more methodologically sound trials in this area of interest.
[a] Steinert Y. Learning together to teach together: interprofessional education and faculty development. *J Interprof Care*. 2005;3(Suppl 1):60-75.[35]	Identifies strategies for facilitating IPE. Focuses on faculty development and how to "ready" the institution for the changes of adopting IPE in a major way. It is recommended that faculty development initiatives aim to bring about change at the *individual* and the *organizational* level; target diverse stakeholders; address three main content areas, notably interprofessional education and collaborative patient-centered practice, teaching and learning, and leadership and organizational change; take place in a variety of settings, using diverse formats and educational strategies; model the principles and premises of interprofessional education and collaborative practice; incorporate principles of effective educational design; and consider the adoption of a dissemination model to implementation. Clearly, faculty members play a critical role in the teaching and learning of IPE and they must be prepared to meet this challenge.
[a] Yarborough, M., Jones, T., Cyr, T. A., Phillips, S., & Stelzner, D. Interprofessional education in ethics at an academic health sciences center. *Acad Med.* 2000;75(8):793-800.[36]	Best practice example of didactic ethics course. Describes planning, development, and outcomes. The authors relate their experiences with interprofessional teaching of ethics at the University of Colorado Health Sciences Center, describing the history, planning, content, and structure of a required ethics course and discussing its role in the institution's plan to create more interprofessional education opportunities. The authors describe both the benefits of teaching ethics on an inter-professional basis and the challenges they encountered in launching the course. Challenges included responding to diverse and divergent faculty and student reactions, controlling a curriculum across schools, and learning how to think about education in interprofessional rather than profession-specific ways.

[a] identified independently by 3 out of 4 reviewers

Appendix 3. Selected Topics for IPE with IOM Competency, Possible Learning Objectives, Potential Teaching Methods, and Timeline for Implementation

Curricular Topic	IOM Competency	Possible Learning Objectives	Potential Teaching Methods	Year in Professional Pharmacy Program
Interprofessional team roles, responsibilities, and professionalism	• Work in interdisciplinary teams • Provide, patient-centered care	• Describe individual roles and responsibilities • Recognize limitations of professional role • Describe roles of other team members and other professions • Identify and describe team dynamics • Describe the change process • Describe professional role hierarchies • Compare and contrast various financial compensation strategies for each team member • Describe education requirements within each profession • Perform assessment of self, individual roles, and team performance • Demonstrate consensus building within a team • Describe and use conflict resolution and negotiation skills • Describe interdependent relationships amongst team members • Develop leadership skills for each team member • Demonstrate professionalism	• Role-playing • Standardized patients,[f] OSCE[a] or TOSCE[b] (used for feedback purposes, not evaluation) • Video: – Identify and discuss examples of good/poor team dynamics – Self- and group-assessment – Demonstrate progression throughout course(s) • Case presentations • Small group case discussions – Patient care scenarios – Why professions were chosen – Recognizing biases and stereotypes • Written assignments – Self-reflection – Team-reflection • Service learning and/or community outreach • Large group interview (patient or another professional) • Experiential education or "exchange" • "Mini-lectures" • Focused (e.g., topic specific) workshops	Appropriate in any year; should start early and be longitudinal
Communication skills	• Provide patient-centered care • Work in interdisciplinary teams	Provider-to-Provider: • Demonstrate effective verbal communication skills with other team members • Demonstrate effective listening skills • Demonstrate patient case presentation skills • Describe communication barriers on interprofessional teams • Document appropriate written communication among interprofessional providers • Describe and use conflict resolution and negotiation skills • Use technology to communicate on healthcare teams • Demonstrate professionalism • Compare generational methods of effective communication Provider-to-Patient: • Demonstrate effective listening skills • Demonstrate empathetic responses/negotiation skills • Describe HIPAA rules and regulations • Demonstrate effective patient education techniques including verification of understanding and use of lay language • Describe health literacy issues • Develop motivational interviewing skills • Demonstrate cultural sensitivity during interactions with patients • Demonstrate professionalism • Establish a comfortable environment and rapport with patients • Compare generational methods of effective communication • Use technology to communicate with patients • Perform effective history taking (patient interview) • Identify patient perspective in specific situations • Demonstrate appropriate response to patient questions General communication: • Describe techniques for responding to the media • Describe the skills necessary to create and facilitate effective teams • Demonstrate effective presentation skills • Describe the components of professional writing • Describe effective advocacy techniques including advocacy plans (patient, political, for IP practice)	• Role-playing • Standardized patients,[f] OSCE[a] or TOSCE[b] (used for feedback purposes, not evaluation) • Video: – Identify and discuss examples of good/poor communication – Self-assessment – Demonstrate progression throughout course(s) • Case presentations to other providers (e.g., SBAR[c]) • Small group case discussions • Grand rounds/seminars • Telephone simulations • Written assignments – SOAP note (or other system) – Portfolio • Service learning and/or community outreach • Large group interview (patient or another professional) • Experiential education • "Mini-lectures" • Focused (e.g., topic specific) workshops	Appropriate in any year; longitudinal
Quality assurance and patient safety	• Apply quality improvement • Provide patient-centered care • Work in interdisciplinary teams • Employ evidence-based practice • Informatics	• Describe CQI/6 Sigma processes and use them to design potential interventions • Evaluate health system and medication errors • Develop medication reconciliation strategies • Perform systems analysis (e.g., root cause analysis) • Complete and submit incident reports, including ADRs • Interpret the IOM reports that discuss patient safety and quality • Evaluate quality measures / standards of care (e.g., HEDIS, Joint Commission National Patient Safety Goals) • Demonstrate proper use of medical abbreviations • Describe the role of the FDA, USP, and AHRQ in health care quality • Describe practice-based research networks and identify their place in contemporary practice	• "Mini-lecture" • Simulated QA project • Service learning (e.g., perform QA for health system or community pharmacy) • Small group case-based examples and discussion • Written assignments • Experiential education • Focused workshops • Interactive video training programs • Expert guest speaker • Student QA competition • Incident reporting and documentation (e.g., site-specific, Medwatch) • Mock or actual attendance at M&M	3rd & 4th year

		• Describe and apply risk assessment and analysis techniques • Analyze patient/customer satisfaction data to make system improvements	conference	
Adherence and persistence	• Provide patient-centered care	• Demonstrate provider behaviors that support optimal patient adherence • Demonstrate techniques to motivate appropriate patient behavior (e.g., motivational interviewing) • Analyze the ability of tools to support optimal adherence or identify potential barriers to adherence • Demonstrate the ability to detect potential adherence problems • Apply principles of disease prevention and health promotion to specific patient situations • Demonstrate the ability to aid patients in setting realistic goals • Apply principles of stages of change, self-agency, self-efficacy, and locus-of-control for adherence promotion strategies • Describe the principles of adult learning and verification of patient understanding	• "Mini-lecture" • Patient education plan • Role-playing (e.g., "walk a mile in patient shoes") • Small group case-based examples and discussion • Written assignments – Marketing materials – Portfolio • Standardized patients,[f] OSCE[a] or TOSCE[b] (for feedback, not evaluation) • Service learning • Student assessment of adherence scenario • Experiential education • Focused workshops • Video examples/series with reflection/discussion • Experiential "exchange" • Expert/patient guest speaker	May be appropriate in all years; longitudinal
Professional ethics (Refer to Ethics SIG sample curriculum)	• Provide patient centered care • Work in interdisciplinary teams	• Define ethics • Describe each professions' code of ethics • Apply the 4 major ethical principles (beneficence, justice, do no harm, respect for autonomy) to specific situations • Perform ethical reasoning (process for making ethical decisions) • Identify plagiarism and demonstrate the ability to submit original work • Demonstrate the ability to maintain the confidentiality of patient information	• Small group case discussion with ethics cases in various professions • Mini-lecture • Role-playing • Debate • Written assignments – Take both sides of an issue and render a decision – Portfolio • Online discussion/blog, audience response systems • Journal club • Experiential education • Focused workshops • Grand rounds • Video examples (e.g., contemporary news or entertainment) with reflection/discussion • Expert/patient guest speaker • Examples of plagiarism • Mock table discussions (e.g., end-of-life)	Appropriate in all years, should start early and be longitudinal
Evidence-based medicine: Clinical research methods, biostatistics, and literature evaulation	• Employ evidence-based practice • Informatics • Provide patient-centered care • Work in interdisciplinary teams	• Define EBM • Define a clinical/research question (e.g., PICO[+] method) • Perform effective literature and database searches • Evaluate and analyze literature that applies to patient care (e.g., clinical trials, POEM[++]) • Evaluate various statistical methods and apply them to various patient data • Define and describe the development and application of clinical practice guidelines and standards of care • Describe scientific methods, study design, and role of IRB • Describe the role of translational research in the health professions	• "Mini-lecture" • Mock IRB/DUR/P&T • Computer laboratory activity – Literature and database searching – Simulations of statistics • Small group presentations based on literature search and evaluation • Develop research plan • Written assignments – Executive summary • Small group journal clubs • Group debates • Experiential education • Focused workshops • Longitudinal topic assignment to therapeutic area (e.g., basic diabetes knowledge building to expertise with clinical trials, etc)	Years 2-4 (but strategies to use databases could be taught in year 1 via inter- or uni-professional education)

[a] OSCE: objective structured clinical examination
[b] TOSCE: Team-based-OSCE to evaluate team effectiveness
[c] SBAR: Summarize Problem, Background, Assessment, Recommendation (a method for non-physicians to present patient information to physicians)
[d] + PICO: Patient, Intervention, Comparison, Outcomes
[e] ++ POEM: Patient-oriented evidence that matters
[f] Standardized patients: simulated patients with feedback (resources needed may include hiring and training actors/actresses, theater students, real patients)