CASE STUDY

Medicine Pharmacy Interprofessional Exercise Pilot: Lessons Learned [version 1]

Samuel Miller¹, Elena A. Wood¹, Michael Fulford², Susan Fagan², Paul Wallach¹

¹Medical College of Georgia
²University of Georgia

Abstract
This article was migrated. The article was marked as recommended.

The Association of American Medical Colleges and the American Association of Colleges of Pharmacy with leaders of other health professions formed the Interprofessional Education Collaborative (IPEC) in 2009. Interprofessional education (IPE) is now a component of accreditation standards for academic programs in both medicine and pharmacy. While geographically separated, the Medical College of Georgia (Augusta University) and the College of Pharmacy (University of Georgia) have over 40 year history of collaboration but never intentionally added joint curricular offerings. To address IPE competencies, we developed and evaluated a medicine pharmacy collaborative exercise. Specifically, to compare the attitudes and perception toward interprofessional education and practice of students from two disciplines. An observational cross sectional study with 208 third year medical (M3) students and 108 third year pharmacy (P3) students was conducted in two consecutive academic years. Groups consisted of 6-8 M3 and 3-4 P3 students from all campuses across the state. The M3 student was to choose a patient they had seen who was taking at least 3 prescription medications. Objectives for students were to discuss the case (medications, side effects, cost, pharmacogenetics, drug-drug interactions, and cost effectiveness). A report of M3-P3 findings was to be submitted for grading by the Pharmacy faculty. Once the exercises were completed surveys were distributed and the de-identified data was analyzed in relation to IPEC competencies. The study was conducted in one academic year and 316 responses were obtained. Within medical students 48.2 % agreed and 21.2 % strongly agreed to consult with Pharm D in the future. Perception of leadership in the groups was shifted more toward pharmacy students (56.5% vs. 27.4%, p<0.0001).

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1. Mary Louise Wright, University of Wollongong
2. Ken Masters, Sultan Qaboos University
3. Trevor Gibbs, AMEE

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Students confidence in working with other professionals was improved more for pharmacy students than medical students (50.0% in P3 and 30.2% in M3 \( p =0.0014 \)). Communication skills improved more in P3 than M3 (48.2% in P3 and 28.3% in M3, \( p=0.0043 \)). More research is needed on equal adoption of IPE by medical and pharmacy students. Emphasis should be made on equal state of training (theory vs. clinical) on both sides with focus on working as a team and value of each team member. More direct involvement in patient care is needed with both M3 and P3 having face to face contact with patients and each other.

**Keywords**
Undergraduate Education, IPE, Medicine/Pharmacy
Introduction

The World Health Organization (WHO) defines interprofessional education (IPE) as the following: “when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes.” [5]. Globally, for over three decades, health policy makers have identified the key role of IPE in improving health care systems and outcomes [6, 7]. Medicine and Pharmacy are uniquely suited to work together in IPE because of the close relationship we share in patient care. Health care reform promotes collaborative practice as one strategy for enhancing the quality and safety of health care [8, 9]. The interdependence between health profession education and collaborative practice is the theoretical basis for implementing IPE within all health profession curricula [10, 11].

The pharmacy program at The University of Georgia (UGA) and the medical program at The Medical College of Georgia (MCG), both parts of the State University System, and both with societal and accreditation mandates for interprofessional education sought to work together to identify and implement opportunities for interprofessional education between learners in each program and to seek other opportunities for collaboration, for example, in areas of research and service to the community. The Medical College of Georgia and the UGA College of Pharmacy have over 40 years history of collaboration but never intentionally added joint curricular offerings. The accrediting bodies (LCME, ACPE) have created new standards which require Medical and Pharmacy schools to incorporate Interprofessional Education as part of their curricular offerings [2, 3]. IPE requirements established by the different accreditation agencies are somewhat different. The programs that we implement together in some cases may meet a particular standard and in others may contribute toward further collegiality and promote other opportunities to collaborate. Medicine and Pharmacy are uniquely suited to work together in IPE because of the close relationship we have in patient care. M3 students have excellent patient assessment skills and P3 students have excellent knowledge of pharmacotherapy. Putting them together to discuss patients would allow both groups to learn from each other to improve patient care and understand different professional perspectives in patient care. In Georgia, the two programs have particular “common ground” as geography is shared across the state. Specifically, the Pharmacy program has the main campus in Athens at UGA and branch campuses in Augusta, Savannah, and Albany. The Medical program has a main campus in Augusta and regional campuses in Athens, Savannah, Albany, and Rome. In several cases, the program administrative offices are juxtaposed. For our IPE exercise we wanted to improve M3 and P3 students’ ability to obtain and organize patients and drug information, gathered from other health care professional students, in order to identify actual or potential drug related problems, to develop a collaborative plan to address each drug related problem and provide justification and document each problem.

The goals and objectives of the study were to state the existing Med-Pharm IPE exercises, evaluate student’s perception of IPE values and attitudes toward future inter-professional collaboration, and describe the Med-Pharm IPE lessons learned.

Methods

This study was an observational cross-sectional study with the participants consisting of 208 third year medical students from Medical College of Georgia (M3) and 108 third year Pharmacy students from UGA College of Pharmacy (P3). All campuses, Augusta, Athens, Rome, Albany and Savannah, participated. The duration of the study was from January 2015 until April 30, 2015.

These students were divided into working groups of 6-8 students (Medicine and Pharmacy). One M3 student in each group selects a patient that they have had in their clerkship who is on three or more prescription drugs and succinctly presents the patient to the group. The presentation includes pertinent history, physical examination, physical test results, and diagnosis. The presentation and all other group interactions were either in person or by distance connection using Facetime, Google Hangout or Skype. The choice of communication was determined by each group dependent on the geographical location of the members of each group. All routine and prn medications were listed. The group discussed all therapies and identified potential drug related problems, assessed the appropriateness of the current medications on the basis of health conditions, indication, and the therapeutic goals of each medicine, and evaluated the effectiveness, safety and affordability of each medication. They discussed drug mechanisms of action, assessed medication-taking behaviors and adherence to each medication, and identified potential medication-related problems and evaluate the need for intervention. Finally, they evaluated these medications for interactions with each other or other common medications and are there any pharmacogenetic considerations. All recommendations were supported with published literature. Fifty eight group cases were submitted (2-page document by email) twice during the study time line. The P3 students were required to submit the completed patient case for 20% of their Pharmacotherapy grade in the Spring Semester. M3 students were not graded on their participation.

Course evaluation was performed electronically, using evaluation systems of two different universities and the results were combined. Surveys were developed for evaluation of the study for curriculum use. The questions on the survey were
developed to evaluate the following: (A) These questions were addressed to both cohorts to evaluate their educational experience; (B) This group of questions were only submitted to medical students on their perception and attitude; (C) This question was distributed in the survey to both cohorts to evaluate leadership skills.

Descriptive analysis was performed. All statistical analysis was performed using SAS 9.4 and statistical significance was assessed using an alpha level of 0.05. Chi-square tests were used to examine differences between medical and pharmacy students in the distribution of Likert scale agreement responses for each questionnaire item. Only data that included in this analysis was where M3 and P3 responses presented.

The study received IRB approval from the IRB of Augusta University, project title 736319-1.

Results and Discussion

Results

A. Educational exercise outcomes

Five questions were asked regarding students’ educational experiences (Appendix 1). The groups felt that they did not function as a team in most cases and the P3’s felt as if they were the sole members of the team. The P3’s felt that the lack of a grade for the medical students resulted in less participation as a team member. Medical students were perceived as being too busy to participate in the team activities and the burden fell on either the pharmacy student or the other members of the group. Figure 1 presents the trend of medical students and pharmacy students responses distribution.

Pharmacy students have significantly higher percentages of strongly agree and agree than medical students on perception of (a) improved understanding of interprofessional practice as a benefit to patient care (P=0.002); (b) improved confidence in interprofessional setting (P=0.0014); (c) improved ability to communicate effectively and efficiently with other professions (P=0.0043); (d) improved understanding of the role on the interprofessional team (P=0.0046).

Medical students have significantly higher percentages of neutral to strongly disagree than pharmacy students in response to the peer responsive less improved confidence and comfort working on an interprofessional team (Figure 2) (P=0.041).

B. Medical Students’ perception

Four questions were asked medical students only (Appendix 1). Out of 208 medical students 21% strongly agreed and 48 agreed to consult Pharm D again. On the ability to meet patient needs medical students majority either agreed (37%) or stay neutral (33%). Same number of students reached agreement or disagreement on more effective way to find drug

![Figure 1. More Pharmacy Students (PS) agree and strongly agree than medical students (MS) that exercise added to understanding of IPE.](image-url)
related information: look by themselves or ask Pharm D (30% vs. 30%). More medical students reached agreement (36%) than disagreement (28%) on perception of working with Pharm D helped understanding of benefit to patient care.

C. Leadership perception
Pharmacy students have significantly higher percentages of strongly agree and agree than medical students on a leadership role on the group (Figure 3) (P<0.0001).

Discussion
We believe IPE is important and have a novel state-wide construct for our MD program (AU) and Pharmacy program (UGA). We developed an exercise for all to work together. Concerned about a new program, we created something that we thought would introduce learners to each other digitally, not require in-person meetings, and would engage in the discussion of a patient.

The educational design of the exercise led to some outcomes that would lead us to redesign the educational excersise. For the pharmacy students, the exercise counted significantly toward their grade. For the medical students, they just needed to complete the exercise without being graded. Therefore, some medical students did not take it as seriously as it should have been. As a result, the pharmacy students saw themselves as leaders of the group more often than medical students. The percentage of neutral on average between the two groups was 20% higher in the group which had educational requirements demonstrates that external motivation exerts an influence on how serious the exercise was approached. This mean that without external motivation (grading) busy medical students do not actively involved into educational excersises.

The pilot study involved a patient that was only seen by the medical student and reported on after discharge. The pharmacy student never saw the patient, but relied on information provided by the medical student. Better outcomes might be expected when simultaneous exposure to the same patient with discussion of findings rather than patient case review.

The exercise involved contact between the two groups of students for only 1-2 hours on one or two occasions. Better outcome about perception of working with different disciplines might improve from working on different patients over a longer period of time. Non face to face encounters had a negative impact on students’ engagement in IPE.

The third year pharmacy students were still in the classroom whereas the third year medical students were clinical and the level of understanding of the exercise was different. Therefore, one of the ideas was to include fourth year pharmacy
students and third year medical students as they both would be involved in clinical care of patients. Earlier intervention in the curriculum may improve the perception of the importance of team based care. This was a limited single exercise that was performed in an environment that did not include face-to-face interaction. It also centered on a patient who was only seen by a medical student, not the pharmacy students, and the patient had typically already been discharged from the hospital. Given the construct, not a surprise that opinions on team care were not as favorable as should be, yet, students agreed that they gained understanding, confidence, communication, roles, confidence, etc even with this very brief exercise that is not optimal in design. Further investigation is needed to understand Medical Students perception of the value of the exercise in team based care.

Conclusion
An attempt was made to incorporate interprofessional education into the curriculum of two schools to evaluate the level of acceptance of working together for a common goal. More research is needed and a redesign of the study is needed for equal adoption of IPE by medical and pharmacy students. The experience that involved an one-time exercise for a few hours does not allow to improve significantly students’ perception of benefit of interprofessional practice for patient care. External motivation was a big factor in investment of time and energy into the exercise and should be taken into account then such educational interventions designed. Level of medical knowledge should be equivalent from all interprofessional groups to be meaningful exercise.

Notes On Contributors
Samuel Jones Miller, PhD, MD provided educational intervention strategies, data collection and preparation and submission of paper.

Elena A. Wood, Phe, MD provided educational intervention, data collection and paper presentation and editing.

Mike Fulford, PhD, provided data analysis and statistical analysis for Pharmacy. Assisted in data evaluation.

Susan Fagan, Pharm D, Study design, supervised study for School of Pharmacy, progress evaluation and data analysis.

Paul Wallach, MD, provided oversight of paper preparation, data analysis and educational evaluation.

Declarations
The author has declared that there are no conflicts of interest.
Appendices

* Med-Pharm Consultant Experience

The core curriculum of a medical education program must prepare medical students to function collaboratively on health care teams that include other health professionals (ED-19-A).

Interprofessional education prepares students to work together to treat complex patients and improve patient care. In order to better prepare you to work on an interprofessional team, you have participated in interaction(s) with Pharm D students. The following questions will assess your experience in Med-Pharm consultations.

| I would change my clinical practice behavior as a result of this experience. | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| I would consult with a Pharm D again. | C | C | C | C | C |
| I saw myself as the leader of the group. (SBP 6.1) | C | C | C | C | C |
| This experience aided in my understanding of the benefits to patients of team care. (PC 2.2, 2.3, 2.4, 2.6) | C | C | C | C | C |
| We were able to collaborate efficiently on meeting the patient's needs. (Com 4.2, Com 4.3, PC 2.5) | C | C | C | C | C |
| It was more effective to ask a Pharm D student questions related to this experience than to look it up myself. (Com 4.2) | C | C | C | C | C |
| Working with a Pharm D student helped me to better understand the benefits of team care. (Pro 5.1, SBP 6.1) | C | C | C | C | C |
| As a result of this experience, my confidence in working with other professionals regarding patient care improved. (Com 4.2) | C | C | C | C | C |
| This shared learning experience helped improve my ability to communicate professionally and effectively with other professionals. (Com 4.2, 4.3, Pro 5.1) | C | C | C | C | C |
| This method of communication was effective. (Com 4.2, 4.5) | C | C | C | C | C |

Would you prefer a different method of communication?

C Yes
C No

If yes, please explain.

| This experience aided in my understanding of my respective role in an interprofessional team. (Pro 5.1, SBP 6.1) | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| The amount of peer responsiveness in this experience improved my confidence and comfort in working on an interprofessional team. (Pro 5.1, SBP 6.1) | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |

| There was discussion related to the risks of medical errors. (SBP 4.2) | A little | Some | A lot |
| The interaction was patient-centered. (PC 2.1) | C | C | C |

The following will be displayed on forms where feedback is enabled...

(for the evaluator to answer...)

Did you have an opportunity to meet with this trainee to discuss their performance?

C Yes
C No

(for the evaluator to answer...)

Did you have an opportunity to discuss your performance with your preceptor/supervisor?

C Yes
C No
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**Version 1**

Reviewer Report 22 July 2019

https://doi.org/10.21956/mep.19531.r28911

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**Trevor Gibbs**

AMEE

This review has been migrated. The reviewer awarded 4 stars out of 5

A well written paper covering the topic of IPL and well structured. The paper pointed out the importance of having pre-determined learning objectives for both groups. I liked the way that the authors described both the positive and negative outcomes of the paper and the way to move forward with their initial findings, which I hope they pursue.

**Competing Interests:** No conflicts of interest were disclosed.

Reviewer Report 04 March 2019

https://doi.org/10.21956/mep.19531.r28913

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**Ken Masters**

Sultan Qaboos University

This review has been migrated. The reviewer awarded 3 stars out of 5

An interesting read and a useful pilot for IPE, which will always present challenges. The grading / not grading is a typical example of problems caused by different requirements of courses that are brought together. The different levels of expertise are also typical of IPE problems. Some issues:• With an opening exploratory study such as though, however, it would have been more useful if the researchers had
allowed for qualitative research also. At the moment, they have answers, but only to the questions that
they anticipated and asked. There may be many more issues that they have not foreseen, and which
could be discovered only with qualitative research. Interviews or focus group would have been advised; at
the very least, a general box asking for other comments in the survey form would have helped. • I do not
see any indication of demographics. As demographics may impact of the student experience, it would
have been worthwhile if the authors had gathered this information, and then analysed in light of those
data. Small issues: • “close relationship we share in patient care” and “because of the close relationship we
have in patient care.” It is not clear here who the “we” is. This needs clarification or correction. • A few
small typographical errors, e.g. “Medical student have”; these should have been cleaned up with good
proofing.

**Competing Interests:** No conflicts of interest were disclosed.

**Reviewer Report 22 March 2018**

https://doi.org/10.21956/mep.19531.r28912

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Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium,
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Mary Louise Wright
University of Wollongong

This review has been migrated. The reviewer awarded 4 stars out of 5

Aims and objectives - clear and highly relevant to IPE Study design - neat and well designed. It would have
been nice to know how often groups met (although I suspect this varied) and whether medical students,
although not graded, had to participate as an expected activity of their curriculum. Results: clearly
explained and well represented. Were the validity and consistency of the survey looked at? The
questionnaire is included in this presentation of the study and is short, easy to use and looks to be well
designed for participant ease of use. The results are interesting and highly relevant in the field of IPE.
Medical student involvement and buy in is always tricky - mainly due to timetabling or packed curriculum
- but this study describes and evaluates a clever model and although Pharmacy students demonstrated
greater commitment and educational value form the exercise there was nevertheless medical student
agreement that they would use Pharm D consults in future. Conclusions/ discussion: Some pertinent
observations made. Thank you - as a person involved in IPE projects with senior medical and allied health
students I both found this paper relevant and enjoyed reading it.

**Competing Interests:** No conflicts of interest were disclosed.