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## IPE Reports

## Interprofessional education through a telehealth team based learning exercise focused on pharmacogenomics

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## ABSTRACT

**Background:** Traditional interprofessional educational (IPE) exercises are those where learning exists “about, from, and with” trainees in two or more professions in order to prepare health sciences professionals to work on interprofessional teams. One emerging difficulty with IPE is the paucity of health profession students at single institutions, and the geographic and financial constraints of multi-institutional collaboration.

**Interprofessional education activity:** To circumvent these barriers, we developed a multi-institution telehealth team-based learning (TBL) event between medical and pharmacy students on the topic of pharmacogenomics (PGx). Using a validated pre-post survey design, student attitudes and perceptions were measured before and after an educational intervention designed to simulate interprofessional telehealth collaboration. The survey results showed significant improvement across all areas of student attitudes toward interprofessional collaboration. Also, medical student PGx confidence increased substantially during the exercise even though the only PGx instruction they received was from pharmacy students.

**Discussion:** These data demonstrate that learning exists “about, from, and with” trainees in other professions, even if they do not physically train in the same location. Free tools are available to create virtual interactions between students on different campuses, and telehealth exercises using these tools are a valid way to conduct IPE across different campuses. The instructional experience does not need to be identical for all participants in the IPE event; rather, tailoring the educational experience to each group of students provides opportunities for inter-student teaching.

## Background

The World Health Organization states that “interprofessional education (IPE) occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes.”<sup>1</sup> The importance of IPE has been amplified since the development of the Interprofessional Education Collaborative (IPEC) core competencies and the integration of IPE into various health professions’ accreditation standards.<sup>2–4</sup> Specific to pharmacy education, the Accreditation Council on Pharmacy Education Standards 2016 (hereafter, Standards 2016) require that pharmacy curricula prepare students to provide patient care in a variety of practice settings as a member of an interprofessional team (Standard 11) and assess student readiness and preparedness to contribute and function as a member of an interprofessional team (Standards 24.3 and 25.6).<sup>3</sup> Students from these

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professions are being prepared for meaningful collaborative practice to improve both individual and population-based health care. IPE activities in healthcare education can take place in a variety of forms. Some examples include simulations, case discussions, and problem-based learning. These can occur in one-time classroom-based activities or through longitudinal experiences within a course, module, or common curriculum among health professions programs.<sup>5</sup>

Another format for IPE is team-based learning (TBL).<sup>6</sup> TBL is an active learning educational strategy that helps students complete course outcomes and function in teams.<sup>7</sup> The individual classes are taught in three steps which include preparation before class, in-class readiness assurance testing, and an in-class application focused exercise.<sup>8</sup> Students work in small groups during TBL application exercises that are centered around the four principles of TBL, also termed the “4 S’s”: significant problem, same problem, specific choice, and simultaneous reporting.<sup>9</sup>

Pharmacogenomics (PGx), the science of how genes affect a person's response to medication, is increasingly being incorporated into the curricula of several health professions, including medical and pharmacy education, as the science of PGx rapidly advances.<sup>10</sup> While some of the incorporation of PGx is driven by accreditation standard mandates for health profession education, incorporation is also logical given the advance of PGx in practice and parallels to existing pharmacokinetic drug dosing and selection strategies.<sup>3,4,11</sup> Given the inclusion of both PGx and IPE in different health profession education programs, a logical opportunity exists to introduce IPE experiences that mirror current interprofessional practice models.<sup>12,13</sup> However, examples of IPE with a PGx focus are sparse in the literature to date, perhaps due in part to the more recent inclusion of PGx across health profession education.

Telehealth is the use of electronic information and telecommunications technologies to support and promote long-distance clinical health care.<sup>14</sup> Health care has seen rapid advancement and implementation of telehealth services and the market is expected to continually grow.<sup>15</sup> Given the growth of telehealth in health care settings, health care education has shifted to provide virtual or e-learning experiences in their programs and they have demonstrated improved learning for an assortment of topic areas.<sup>16,17</sup> Even though e-learning is evolving in individual health professional programs, e-learning as an educational strategy for IPE is less frequently reported.<sup>18</sup>

Despite the documented value and necessity of IPE, barriers to IPE including geographic constraints and financial cost have been reported in the literature.<sup>19</sup> One potential strategy to overcome these barriers is to adopt a telehealth-focused IPE simulation as a way to reduce the logistical hurdles of IPE integration. Examples in the literature of telehealth-focused simulations are sparse, particularly when involving more innovative areas of practice like PGx. The purpose of this interprofessional education activity is to implement a telehealth IPE TBL exercise focused on PGx and assess medical and pharmacy student attitudes toward interprofessional collaboration and PGx confidence.

### Interprofessional education activity

Western Michigan University Homer Stryker M.D. School of Medicine is a private, non-profit, allopathic medical school in southwest Michigan. Ferris State University is a public, non-profit university with a variety of health sciences programs and a college of pharmacy. Ferris State University College of Pharmacy has two campuses approximately 50 miles apart; the campus where this exercise took place is approximately 50 miles north of Western Michigan University Homer Stryker M.D. School of Medicine. The medical students participating in this study were enrolled in BIOM7210, Hematology and Oncology, a required course in the first-year medical curriculum (M1) at Western Michigan University Homer Stryker M.D. School of Medicine. The pharmacy students participating in this study were enrolled in PHAR590 Medication Therapy Management, an elective course for third professional year (P3) pharmacy students at Ferris State University. Medical students were frequently engaged in TBL at this point in their program; this pedagogy is employed but to a lesser extent for pharmacy students. Neither group was exposed to routine telehealth simulation. M1 students, given their point in the program, had limited prior IPE involvement, but P3 students had been exposed to several IPE activities, described more thoroughly elsewhere.<sup>19</sup> Given the familiarity of TBL across both programs, the value of telehealth, and the geographical limitations, a telehealth-focused TBL activity was chosen to minimize logistical hurdles and engage students interprofessionally in an innovative way. All students enrolled in the courses were required to participate in the IPE activity and were invited to complete surveys to help assess the activity.

This IPE activity was a TBL exercise designed to serve as a two-hour stand-alone exercise within each curriculum. The application exercise was initially presented in the large group setting via PolyCom™ conferencing. Briefly, the case involves a patient with sickle cell crisis and acute chest syndrome who has no history on file at the current hospital when she presents to the emergency room requesting a scheduled narcotic. In order to address the values/ethics for interprofessional practice IPEC core competency<sup>2</sup>, an ethical conversation took place in the large group setting about pain management, then students broke into small groups consisting of six medical students and two pharmacy students communicating via Google Hangouts™ to plan clinical diagnosis, drug therapy, and pharmacogenomics data analysis (total of 12 groups). In total, roughly 60 min was spent across large group conferencing, roughly 30 min was spent across small group conferencing, and roughly 30 min was spent discussing among each discipline separately in the classroom without conferencing assistance.

Once roles were assigned, medical students, and pharmacy students conducted separate class exercises. The medical student class exercise focused on the pathophysiology and biochemistry of sickle cell disease, the diagnosis of acute chest syndrome, and the development of comprehensive treatment strategies for a sickle cell patient with acute chest syndrome. The pharmacy student class exercise focused on analysis of pharmacogenomic data that may aide in predicting the response to narcotics and utilization of simulated data representing use of the Michigan Automated Prescribing System (MAPS), a statewide prescription monitoring program designed to track the use of scheduled narcotics in individuals over time. Towards the end of the exercise, small groups reconvened via Google Hangouts™ to teach each other about the diagnosis, comprehensive treatment plan, and recommendation for

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