

The importance of collaboratively designing pharmacology education programs

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Abstract

A grounded knowledge of pharmacology is essential for healthcare providers to improve the quality of patients' lives, avoid medical errors, and circumvent potentially dangerous drug–drug interactions. One of the greatest tools to achieve this foundational knowledge of pharmacology is the dedicated pharmacology educators who teach in health sciences programs. Too often, the pharmacology educators responsible for teaching this material are left siloed at their own institutions with little room for dialog and collaboration. As scientists, we know that it is through dialog and collaboration that ideas grow, are refined, and improve. More collaborative work is needed to identify and describe best practices for pharmacology education in health sciences programs. While evidence-based, outcomes-focused studies are the optimum standard for this work, there is also a place for descriptive studies and innovative reports.

Many allied health programs around the globe are shifting away from stand-alone pharmacology courses to develop integrated curricula, where pharmacology is taught as one of many foundational science disciplines integrated through case-based active learning sessions. In theory, this transition presents unique opportunities for creative collaboration with other foundational science faculty, natural reinforcement of the disease mechanisms that buttress the action of most therapeutics, and increased neural connections for our learners. However, the reality is that many pharmacology educators

are isolated and overwhelmed, receiving little guidance on how to maximize efficiency. We are forced to teach a perpetually increasing number of drugs in a perpetually shrinking number of hours, sometimes in a fragmented manner over time. Throughout this process of maximizing efficiency, we all ask the question, “What is sufficient for learning for pharmacology in this health sciences program?”

While attending the International Association of Medical Science Educators (IAMSE) annual conference in 2018, we found ourselves asking this very question. What started as a conversation during

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a 90-min conference session has now been an ongoing dialog for nearly three years. Over the past 33 months, we have continued this conversation in monthly calls where we discuss everything from pharmacology learning objectives to drug lists to assessments, and everything in between. Creating this virtual community of practice has had many benefits¹:

- Created space for dialog
- Provided opportunities for learning from one another
- Helped us define our goals as educators and as educational researchers
- Evolved over time to an iterative quality improvement cycle where research informs dialog, which informs our educational practice, which drives new research
- Allowed us to see the larger picture on the impact that different curricular formats have on the delivery of pharmacology

We have presented themes from our work at subsequent IAMSE conferences (Figure 1) and the American Society for Pharmacology and Experimental Therapeutics (ASPET). Most recently, we have

described the integration of pharmacology across seven preclinical medical curricula in the United States in our article, "Design of a Foundational Sciences Curriculum: Applying the ICAP Framework to Pharmacology Education in Integrated Medical Curricula."² We are very pleased to share our work in this issue of *Pharmacology Research & Perspectives*, and we hope this will serve as the first of many reports on pharmacology education in this journal.

In the current study, we described the number of hours, teaching pedagogies, resources, and assessment strategies from each of our curricula. We then took a deeper dive into the pedagogies we used during our pharmacology instruction because we wanted to know whether we used different pedagogies when pharmacology was integrated at the session level (such as during a case-based session) compared with those sessions where pharmacology was taught independently, such as through didactic lectures or podcasts. To do this comparison, we applied the ICAP Framework, which differentiates activities based on cognitive engagement of the learners. We found that, according to this framework, pharmacology is presented in more engaging ways when it is integrated with other disciplines. This work supports the integration of pharmacology in



FIGURE 1 Clockwise, from top left: Stephen Schneid, Marieke Kruidrig, John Szarek, Joe Blumer, Naunihal Zaveri, Micheal Lee, and Kelly Quesnelle

health sciences education, but many questions remain unanswered following our work:

- Do other schools follow similar trends as we have described here?
- What are the trends at other health sciences practices such as dental, nursing, and physicians' assistant programs?
- Do certain pharmacology topics lend themselves better to certain teaching pedagogies?
- Who teaches in allied health pharmacology programs, and how are they trained to do so?
- Should an update of the 2012 Knowledge Objectives in Medical Pharmacology be undertaken, and if so, by whom?
- Is there a way to examine the outcomes of diverse pedagogies for pharmacology across multiple institutions?
- How do pharmacology educators utilize third-party resources in their curricula?
- How is pharmacology education monitored and assessed in the curricula?
- Are pharmacology educators critical players in the curriculum development discussions at all allied health institutions, or is this more varied from institution-to-institution?

Outcomes-based research studies remain the gold standard for answering these questions, but we hope our work shows that there is also a place for mixed methods research, as well as quantitative and descriptive studies to address these questions and others that will arise. Several nations outside of the United States have advanced the conversation before us, providing descriptive work detailing their national pharmacology education practices, but many of these reports are also decades old and worth revisiting.³⁻⁵

There is a need, now more than ever, for a place to expand the pharmacology virtual community of practice. Pharmacology educators need a place to present ideas and research in a peer-reviewed format. We need to dialog with one another in a manner most befitting of academics: through scholarly discourse. We hope this work, standing on the shoulders of our colleagues from around the globe who published curricular surveys before ours, drives continued

conversation about the topics we presented, as well as those described here. It will likely generate dialog about topics we may not have yet even considered. Through this type of research and discourse on topics specific to pharmacology, we will continue to advance the pharmacology educational experience for trainees at our own institutions, as well as improve ourselves as pharmacology educators and administrators.

DISCLOSURE

The authors declare that they have no conflicts to disclose.

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