Strengthening the Clinical Laboratory with Simulation-Enhanced Interprofessional Education

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LEARNING OBJECTIVES

1. Explain the significance of interprofessional collaboration as it relates to patient safety and diagnostic errors.
2. Distinguish the difference between interprofessional education and multiprofessional education in healthcare simulation.
3. Align interprofessional core competencies with their fundamental principles.

ABBREVIATIONS: IPEC – Interprofessional Education Collaborative, IPE - Interprofessional education, CLS – Clinical laboratory scientist

INDEX TERMS: Interprofessional education, Interprofessional simulation, Role clarity

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INTRODUCTION

In 1998, the Institute of Medicine (IOM) published the report, To Err is Human, in which they stated that up to 98,000 people die each year due to medical errors.[1] A more recent study, published in 2013, estimates that preventable adverse events contribute to nearly 210,000 premature deaths per year.[2] The body of literature on patient safety and error prevention continues to grow with much of this literature focusing on effective communication and teamwork.[3-5]

In the report, Improving Diagnosis in Healthcare, the IOM recommends increasing collaboration among medical professionals to reduce diagnostic error. Working in interprofessional teams is also encouraged in the educational realm.[6] Graduating students who are knowledgeable about and proficient in interprofessional teamwork and communication should be a priority in healthcare education programs, including Clinical Laboratory Science (CLS). Simulation-enhanced interprofessional education is one way to promote and practice effective communication and teamwork.

Interprofessional Education

Interprofessional education (IPE) is defined as people from different professions learning about, from, and with each other.[7] This differs from multiprofessional education, where students learn side by side, but interaction is not required. The Interprofessional Education Collaborative (IPEC) was formed to promote and encourage interprofessional learning. They developed four core competencies for interprofessional collaborative practice to use as a framework for activity development and curriculum design in education (Table 1).[8] The goal is to transform healthcare education and, in turn, have graduates of these programs change and strengthen the quality of patient care in our healthcare systems.

As laboratory science students progress through their curricula, they need to grow beyond theoretical knowledge and application to fostering professional relationships and collaborative behaviors. This includes their peers in the clinical laboratory as well as other professionals within the healthcare system. It

has been noted that introducing learners to IPE early on in their curriculum is associated with positive learning outcomes.[9]. Simulation is an innovative alternative for conducting interprofessional education with healthcare professionals.

Table 1. Interprofessional Education Collaborative Core Competencies

Interprofessional Core Competency	Fundamental Principle
Values/ethics for interprofessional practice	Maintain a climate of mutual respect and shared values with individuals of other professions
Role/responsibilities	Acknowledge team complexity and roles of other professionals
Interprofessional communication	Communicate in a manner that supports a team approach to healthcare
Teams and teamwork	Apply relationship-building values and care that is safe, timely, efficient, effective, and equitable

Simulation-Enhanced Interprofessional Education

Didactic education continues to be driven by traditional delivery methods (i.e. instructor-led lectures) in a static classroom setting. However, the collaborative nature and complexity of healthcare delivery should steer the education methods away from strictly passive learning to active, learner-focused education environments. Through the incorporation of other educational strategies such as simulation, learners will be able to engage themselves in real-time simulated healthcare events that emphasize teamwork among healthcare professionals.

In the manuscript, The Future Vision of Simulation in Health Care, David Gaba states that "simulation is a technique—not a technology—to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner."[10] Although IPE and simulation are two distinct concepts, they can be utilized together to enhance a student's self-efficacy and positively influence a student's outlook of collaborative practice. In medicine, simulation can be used for skill attainment such as phlebotomy and cardiopulmonary resuscitation and to extend into more complex objectives such as teamwork, interpersonal communication, and professional role clarity.

There are many barriers to participating in simulation, especially interprofessional simulation. It is resource intensive, requires space, trained faculty, supplies, and the buy-in of leadership from a variety of programs to incorporate time in the curriculum to participate in simulation. In addition, we have a tendency to teach in silos and vigorously protect our "turf" while also finding it challenging to compromise on scheduling and scenario content. Furthermore, students from different healthcare programs progress through curricula at discordant rates. For example, nursing students may be in their second semester while laboratory science students are in their 4th semester. Programs vary in length and sequencing can differ even within the same profession. Additionally, there may be a lack of support and funding from administration. Although there are barriers to creating and participating in meaningful, collaborative IP simulation experiences, we will present low resource options and suggestions for creating partnerships with other professions to facilitate these valuable opportunities.

Often times, facilities that provide medical care concentrate their efforts on improving communication between nursing and physicians. The incorporation of additional professions into the process can provide an even greater benefit for the entire healthcare team. Large hospital-based laboratories run millions of tests each year and provide volumes of data on which diagnoses and treatments are based. Additionally, the number of laboratory tests available to practitioners has more than doubled in the past 20 years.[11] The collaborative efforts for an entire healthcare team should strive to work towards a shared, overall goal – increased focus on patient safety and care. Yet, traditionally, laboratory science students have not been involved in interprofessional education and simulation. Simulation scenarios often last 10-20 minutes, not allowing enough time for laboratory testing to be completed. Extended time simulations or analysis of specimens already received and "in progress" can be used to facilitate incorporation of the laboratory into simulation.

Determining the readiness of a student to engage in interprofessional education is necessary prior to making curricular changes. Meaningful collaboration

will not be attained if students are not prepared, do not feel ready, or do not value the opportunity to participate in this type of learning. Assessing students for readiness, determining where in a curriculum interprofessional learning should occur, and designing the appropriate scenario is vital to maximizing positive learning outcomes.

Theoretical Framework for Simulation

Experiential learning theory was described by David Kolb in 1984. He characterized learning as the process where "knowledge is created through transformation of experience."[12] Experiential learning consists of four phases 1) concrete experience, 2) reflective observation, 3) abstract conceptualization, and 4) active experimentation. These parallel the phases of healthcare simulation.[13] Figure 1 is a formatted depiction of healthcare simulation adapted to Kolb's model of experiential learning theory. A learner in an interprofessional simulation can participate in an immersive scenario and learn through critical thinking and adaptation rather than strictly content delivery as is often the case in a classroom setting.

Levying Kolb's proposal that people learn through interactions with people and the environment, simulation expands on the traditional classroom and student laboratory experiences. This includes professions outside of the laboratory with which MLS students interact. MLS programs utilize experiential learning in the student laboratory with case-based specimen analysis; however, it is time to break out of the silo and teach students how to work on interprofessional teams prior to entering the professional healthcare setting.

Implications for Clinical Laboratory Science Programs

IPE can play an integral role in laboratory science education. Interprofessional team practice has been shown to foster a sense of value of collaborative practice.[14] After all, we need to value working together before we can succeed as a team. Educators need to extend beyond the psychomotor and fundamental cognitive domains of learning and help students prepare for intricate, patient-centered discussions with team members.

Engaging students from a wide array of professions in simulation also promotes role clarity or a better understanding of the part each team member plays in the care of a patient. The phrase "behind the scenes" has been used, all too often, with the clinical laboratory. Simulation provides the opportunity to promote our crucial contributions to healthcare while participants are still in the educational setting. It is anticipated that this understanding will transfer to clinical practice and encourage a variety of team members to engage the laboratory in patient care conversations.

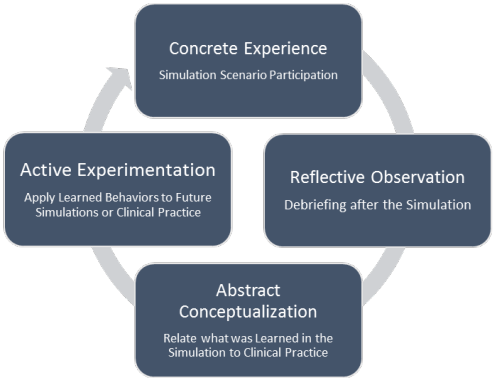

Figure 1. An adaption of Kolb's model as it pertains to simulation and experiential learning theory

Experiential learning through IP simulation should be a fundamental part of MLS education. Faculty and students spend many hours in the laboratory perfecting pipetting skills and streaking plates, but we need to transcend this technical focus and use IP simulation to ensure a place at the table during patient care discussions.

This focus series is aimed at informing educators, laboratorians, and other healthcare professionals about the value of incorporating clinical laboratory science students into simulation-enhanced interprofessional education. In addition, a full spectrum of CLS-incorporated simulations are described. This is to help programs take action. Some may be ready to initiate their first simulation experience and others may be ready to challenge themselves and increase the complexity of their ongoing interprofessional simulations.

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