Interprofessional Telemedicine Competency for Health Care Students with Remotely Operated BioMedical Telepresence Systems (ROBOTS)

Gwen W. Halaas, MD, MBA; Richard N. Van Eck, PhD, MA; Jon Allen, MD; Eric Johnson, MD; Cheryl Stauffenecker, MS, CNS
University of North Dakota School of Medicine and Health Sciences

Innovation Identified

Longitudinal Rural Interprofessional Healthcare Simulation
This intervention incorporates students in five healthcare professions into learning through simulation. This three-scenario series reflects the real-world longitudinal nature of healthcare delivery from diagnosis, to intervention and treatment, and end-of-life. In each scenario, telemedicine is integrated as a natural part of the healthcare delivery process, with each profession playing a role consistent with how the case would typically unfold in the real world.

In Scenario 1, “Sandra” arrives in the emergency room with chest pain/pressure in the center of her chest and radiating into her left axilla. She has been short of breath with activity for the past two days, and rest has not made it better. She is eventually diagnosed with a myocardial infarction (MI). Interprofessional team members include a nurse (RN), a physician (MD), and a cardiologist (telemedicine); others could include phlebotomy and radiology.

Innovation, Continued

In Scenario 2, Sandra has had a stent placed and an echocardiogram showing a 40% ejection fraction. She does not have cardiac rehabilitation in her small town and insists on going home. At follow up, her primary care physician orders a home health assessment. Home health identifies specific needs and involves other members of the healthcare team in planning.

A care conference is called two weeks later. The team comprises an MD (telemedicine), a home health nurse, an occupational therapist (OT), a physical therapist (PT), a social worker (SW), and a family member. It is determined that Sandra should be admitted to long-term care (LTC).

In Scenario 3, Sandra has been admitted to LTC and has had a significant incident. She is physically deteriorating and in a critical state. During a telemedicine consult with the MD (telemedicine), end-of-life planning takes place among an MD, SW, CNA/RN, and family members.

Resources Needed and Potential Barriers

Instructional Resources
Simulation resources including scenario design document, scripts, instructional handouts, assessment instrument (CATS-T) and simulation parameter programming resources which are all available upon request.

Human Resources
Personnel for running all three parts of the simulation, including faculty and standardized patients; students from medicine, occupational therapy, nursing, physical therapy, and social work; and telemedicine consultant (who may be be played by a medical student, faculty, or a clinician).

Technology Resources
Telemedicine technology (monitors, cameras, and telepresence robots are ideal) and simulation technology capable of relaying scenario data (e.g., Bluetooth stethoscope).

Potential Barriers
The time commitment is significant, and coordinating curricula for multiple professions can be difficult. Telepresence and simulation technology are expensive, and integration with existing curricula is challenging.

Timeline Proposed

Initial Planning: 5 Weeks. Two weeks needed to arrange and conduct conference call/Web meeting and to get documents. One week needed for follow-up questions based on reviews, and two weeks to work with stakeholders.

Identification of Resources: 2 Months. One month needed to identify and test telemedicine technology. One month allotted to purchase robots, Bluetooth stethoscopes, etc.

Training and Preparation: 2 Months. Time needed for this phase is dependent on the institution personnel level of training and familiarity with simulation and on the availability of standardized patients and students from relevant professions. One month may be required to modify instruments to meet local standards and outcomes. One month should be planned to conduct interrater reliability training on the CATS-T instrument and for scenario pilot testing.

Implementation: 1 Hour per Scenario. Each part of the scenario requires a different mix of students and may be run back-to-back or over the course of weeks or months depending on the needs of the curriculum and the available resources.

Need/Gap and Stakeholder Input

Need/Gap: Interprofessional education (IPE) is required of all medical programs. Teamwork in low-resource rural settings requires effective communication among professionals in different locations to provide effective care to patients requiring critical care. Few guidelines exist for IPE or team-based care in rural health care settings with telemedicine.

This scenario was designed to address competencies from the Interprofessional Education Collaborative (IPEC) competency domains: 1) values/ethics, 2) roles/responsibilities, 3) communication, and 4) teamwork and team-based care.

Stakeholder Input: Our design team includes core stakeholders: the director of the simulation center; the director of IPE; a team of simulation center personnel who design, develop, implement, and test simulations; our Associate Dean for Teaching and Learning; and our Senior Associate Dean for Education.

Other stakeholders include faculty in occupational therapy, physical therapy, social work, and the physician assistant program, all of whom have been consulted in the design and implementation of this scenario. Feedback is positive and supportive of an ongoing commitment to designing and implementing intensive, longitudinal interprofessional scenarios like this for the future.

Institutional Contact

Thank you to the American Medical Association for funding, and to the University of North Dakota Vice President for Health Affairs and Dean of the School of Medicine and Health Sciences, Joshua Wynne for his support.

Thank you also to Stephanie Flyger, SHAPE Program Coordinator, and our students David Anderson, Jill Oversten, Natasha Garcia, Bryan LaBore, Steven McKnight, Scott Poswilko, and Emily Schwartz for assistance with photography.

For more information, contact:
Gwen Halaas, Senior Associate Dean for Education gwen.halaas@med.und.edu
Richard Van Eck, Associate Dean for Teaching and Learning richard.vaneck@med.und.edu