



High fidelity simulation in Canadian paramedic education

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In 2011, the Paramedic Association of Canada (PAC) released the second iteration of the National Occupational Competency Profile for Paramedics (NOCP), which contained changes to the overall competency structure (adding a new section) and many of its competencies. In addition, a new appendix allowed educational programs to use high fidelity simulation (HFS) to supplement the assessment of selected competencies in the

Paramedic education programs, like other high-risk disciplines, make extensive use of simulation. The NOCP specifies over 150 specific PCP competencies that must be demonstrated in simulation. Of these, 16 must be further demonstrated in the clinical and 76 in the practicum setting. Simulation encompasses a wide range of learning activities, including skill stations (mastering psychomotor skills such as drug administration), role plays (e.g. practicing communication skills), drills (for example, primary survey that integrates assessment with airway procedures), and full-call scenarios (for example, a cardiac arrest call). Each type of "simulation" focuses on a particular type of practice-based learning and involves a different blend of "fidelity."

Fidelity (sometimes called "realism;" see, for example, Rudolph, Simon, & Raemer, 2007) indicates the degree to which a simulation represents or recreates the "real" environment of field practice (Gaba, 2004; Garrett, Tench, et al., 2007). A "low fidelity" simulation might include a classroom drill using students as mock-patients. An instructor provides verbal descriptions of the scene and assessment findings. "High fidelity" simulation, in contrast, has come to indicate scenarios set in authentic locations (or in labs or rooms using props to recreate authentic locations) and either standardized patients (specially prepared actors) or computerized mannequins ("human patient simulators" that provide realistic pulse, BP, and ECGs, and allowing students to perform procedures such as IVs, intubation, etc.). The use of HFS in health education has grown significantly, and many health programs have simulation laboratories with HF mannequins in mock hospital wards and operating theatres.

Paramedics, however, practice in a different environment than other health providers, requiring different blends of fidelity. The HFS environment described in Appendix A of the NOCP recognizes that, if HFS is to be used to replicate the practicum environment, then the simulation environment must highlight several types of fidelity:

Physical (or Environmental) Fidelity: Paramedics function in a wide variety of settings. Often, gaining access, functioning in cramped situations, or dealing with weather are factors that affect what and how paramedics complete their calls. Thus, a paramedic HFS must include realistic environments, such as

clinical and practicum domains. The appendix was developed in cooperation with the Society for Prehospital Educators in Canada (SPEC). SPEC is currently consulting with PAC and CMA to refine the policy and develop resources for its implementation. Programs may use HFS to obtain up to 10 per cent of clinical and practicum competencies after a student has completed a full practicum.

The structure of the NOCP assumes that effective learning involves the progressive development of skills, knowledge and attitudes across a series of performance domains:

outdoor settings, home/office locations, or on roadways (e.g., in a cordoned off parking lot).

Social and Interpersonal Fidelity: A key element of the practicum is learning how to interact in a dynamic, social environment that includes the patient, family, bystanders, other responders and other health providers. HFS for paramedics must include more than a patient and an ambulance crew.

Physiological and Procedural Fidelity: These are the facets of fidelity most often associated with HFS. Standardized patients and mannequins allow students to practice assessment and treatment in a more authentic manner. Note that, for a HFS scenario, it is important that students encounter patients who represent the appropriate gender, apparent age, and physical presentation of the calls they are engaged in.

Conceptual (or Cognitive) Fidelity: Effective HFS provides an overall experience of sufficient context and realism that creates a sense of functioning in an actual clinical or field environment.

While a growing body of literature supports HFS as an effective learning environment, HFS is often seen as a supplement, but not a replacement, for practicum experiences. Further research is required to better understand how learning emerges in simulation environments (Quayumi et. al., 2012). A key component of this research will include exploration of what fidelity means in different disciplines.

Paramedics practice in unique settings. And so, an effective high fidelity simulation environment must be able to represent and replicate the complexity and dynamic context of paramedic practice.

students establish a theoretical foundation in the academic setting, then master skills and procedures in simulation, followed by application in the clinical (hospital) and practicum (field) setting. The practicum is a critical step, linking classroom learning and field practice. Paramedic programs across Canada face increasing challenges in finding adequate practicum placements as both the number of students and the expectations of the practicum have grown. HFS holds promise for relieving some of the pressure on the practicum environment.

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