As students progress through professional athletic training education, they engage in a variety of clinical experiences. Unfortunately, circumstances that will provide opportunities to practice clinical skills during clinical rotations are unpredictable. One example is auscultation of lungs, heart, and abdomen, which is taught with audio recordings of normal and abnormal sounds. Although these clinical skills can be practiced on healthy individuals, students often lack the opportunity to be exposed to patients who present abnormal sounds. In an effort to provide athletic training students a rich educational experience, we began utilizing low- and high-fidelity simulations as part of our general medical conditions course in the fall of 2006. The purpose of this report is to describe the manner in which low-fidelity simulation can be used to teach general medical psychomotor clinical skills to athletic training students.

Simulation Defined

Simulation in athletic training education has been defined as a scenario or clinical situation in which a student evaluates a mock patient/athlete who portrays a sham injury or condition (e.g., shoulder pain, acute cervical spine injury), which differs from its description in the medical and nursing education literature. Simulation is generally viewed by athletic training educators as a one-on-one experience between a student and a preceptor. In medical and nursing education, simulations may involve more than one student, and depending on the objective, a preceptor may simply be observing. There is no standard definition of simulation in the nursing education or general education literature. The term fidelity refers to the degree of realism provided by the simulation. To clarify the meaning of the term simulation, it can be defined as engagement of learners in life-like experiences that mimic real clinical encounters, which can have varying levels of fidelity. During the simulation, the student could engage with other students, a standardized patient, and/or technology, such as a low- or high-fidelity simulator. For example, a spine-boarding simulation could include 5–6 students, a simulator or standardized patient, emergency medical technicians, and nurses. Simulations challenge the learner to develop communication and clinical skills without the potential for any detrimental impact on the patient or the student. The technology used during simulations can range from low-fidelity (e.g., mannequins, partial models) to high-fidelity (e.g., instructor-controlled computerized mannequins) representations.
of a patient’s status and responses to interventions. Simulation has been integrated into medical and nursing education for decades, and is now a central component.

An abundance of literature exists concerning the learning benefits derived from the use of simulation. A recent meta-analysis determined that simulation-based education was superior to traditional clinical education (e.g., “see one, do one, teach one”) for the acquisition of clinical skills relating to advanced cardiac life support and cardiac auscultation. Another recent meta-analysis documented superior learning outcomes (e.g., knowledge, process and product skills, time behaviors) for technology-enhanced simulations (e.g., computer-based virtual reality simulators, high-fidelity and static mannequins) compared to traditional educational practice. The authors recommended that future simulation research should focus on when and how to use simulation most effectively and cost-efficiently.

**Low and High-Fidelity Simulations**

Low-fidelity simulations use devices such as partial-task trainers or full-body mannequins to practice and acquire psychomotor skills. Partial-task trainers are models or mannequins that represent a body part, such as an extremity or anatomic structure. Such devices allow the learner to focus on an isolated task. High-fidelity simulation utilizes an instructor-controlled computerized mannequin that can speak to the student and physiologically respond to interventions (e.g., decreased heart rate, blood pressure). An instructor (typically located in an adjacent room) controls the mannequin’s vital signs and speaks to the student through a microphone inside the mannequin. The learning objectives of high-fidelity simulation vary depending on the needs of the learner, which can include improvement of skill performance, communication, or rapid management of the situation.

**Low-Fidelity Simulation Lab**

Athletic training students enrolled in our general medical conditions course visit the Simulation and Information Technology Center (SITC) housed in our university’s School of Nursing for three two-hour lab sessions with simulators. During the first visit, the objective is to orient the students to the SITC and to practice previously learned clinical skills. The latter two visits involve engagement in high-fidelity simulations. During a class period prior to the first SITC visit, the uses of low- and high-fidelity simulators are reviewed. On the first SITC visit, students become acquainted with a low-fidelity simulator (Figure 1) and its surroundings.

![Figure 1](image-url) Low-fidelity simulator.