

## USE OF SIMULATION IN NURSING EDUCATION

Sabbatical Report for Spring 2007

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*NOTE: to accomplish my sabbatical aims, I attended workshop/meetingss with the Oregon Simulation Alliance, the Oregon Consortium of Nursing Education, a three day workshop on Simulation by the American Association of Colleges in Nursing in Denver, Colorado, and visited McGill University in Montreal, Canada to observe their simulation center.*

The term “simulation” in the context of nursing education, has for most people come to mean extremely expensive, high technology robots. One of the findings of my sabbatical is that there are other, less expensive forms of simulation now being used in nursing schools along with these high tech robots. In fact, there are even options to use simulation to create revenue for a nursing program. Most importantly, all these new techniques can be used to improve nursing education both in quality and efficiency.

Nursing instructors have simulated patient scenarios for many years.

Traditionally, these older simulations fell into three categories:

1. Static non-interactive mannequins to represent patients. These have been the same type of mannequins used in department store windows.
2. Students taking turn role-playing as patients and families.
3. Jerry rigging whatever the faculty could find to represent patients. Examples would be having the student inject hypodermic needles into oranges instead of arms, catheterize a Coke bottle instead of a urethra, etc.

The problems from this old-fashioned technique is that

1. It requires a lot of pretending, enough so that the original educational goal gets lost. The amount of miming involved (pretending to operate equipment that is not in fact there) tends to weaken the learning experience. It is not unlike telling a music major to pretend that there is a piano in front of him.
2. Old-fashioned mannequins are unrealistic. The students feel that they are playing with dolls.
3. Having students role-play sick patients is rather pointless, because most students are healthy young people with healthy sounding hearts, lungs, etc. Having the students take turns role playing as patients or families has limited value, since the students’ primary educational goal is to learn the role of the nurse. Students pretending to be patients often abandon the role to help out their peers by giving them the answer.

Students tend not to “buy in” to this old-fashioned make-believe. More importantly, the students learning in this environment rely on instructor or peer feedback alone. There is very little opportunity for meaningful self-evaluation.

The advantages of modern simulation learning in nursing are

1. The student is usually videotaped, and then has the opportunity to see how he or she performed. Some schools play the videotape to a larger number of students for class discussion.

2. This is a more non-threatening way to learn. The student feels more comfortable learning the motor skill or the interpersonal interaction than if he or she were performing it for the first time in front of a real patient, that patient's real family, real nurse, and real physician in a very real, very hectic hospital setting.
3. There is greater patient safety. The student has the option of making mistakes and learning from these mistakes without endangering a real person.
4. It is a more efficient way to teach. Thirty students can watch a videotape of one student performing in a simulated setting, and learn from a class discussion, rather than thirty students performing every possible scenario themselves and getting the feedback of one instructor thirty times.
5. The nursing faculty can choose experiences that each student may not run across in the clinical setting. For example, interacting with the actively suicidal patient is not an experience that every student is likely to see during clinical rotation.

There are four basic forms of simulation in nursing education.

1. High fidelity mannequins.
2. Low fidelity mannequin parts.
3. Live broadcasting of skills.
4. Dedicated patients.

High Fidelity Mannequins are robots that are highly complex, and offer the student great opportunity for physical assessment. The student can listen for various breath sounds, heart sounds like murmurs, and take blood pressures. They can respond to rapidly changing patient situations like shock or childbirth. It is a fantastic tool to help students learn prioritization of care, professional conduct under stress, and delegation of care. High Fidelity Mannequins are not ideal to simulate patient situations that are highly psychosocial. Even though faculty can make the mannequin talk through an implanted microphone, true communication through eye contact and body language is not represented. Another issue is that not all faculty are comfortable with high fidelity computerized robots. If a large number of faculty are teaching the same scenario with Simulation robots, in order for interrater reliability it becomes necessary to write the scenario out as a "play", which is very time-consuming.

Low Fidelity Mannequin parts are basically truncated fake body parts. Examples are an arm that IVs can be placed in, a torso that tubes could be inserted into with reservoirs for urine or gastric secretions to come out, etc. These are generally much less expensive, although still offering more reality than an orange or an empty Coke bottle. For efficiency, it is important to realize that a full-scale mannequin isn't required for every skill.

Live broadcasting of skills can be a very cost-effective way to teach. Traditionally, intricate nursing skills are shown only to as many students as can crowd around the instructor. At McGill University, the skills lab is set up like an operating room, with about fifteen OR tables. Each table has a computer screen. The instructor's table has a suspended microphone and camera. As the instructor demonstrates an intricate skill, the image is broadcast to every student in the large room. The students

can then ask the instructor for clarification and questions immediately, and the instructor can observe the students performing the skill.

Dedicated Patients are actors from outside the nursing school who play the role of patient or family member. If these are professional actors, the school pays them. Some schools use volunteers or students from their own drama department. An advantage to this system is that psychosocial patient situations can be played realistically. The patient is played very realistically by a serious actor, not haphazardly by a fellow nursing student. Therefore the nursing student tends to buy into the experience more. Also the nursing students can get feedback on their interpersonal skills from someone other than another nursing student. The student is more likely to be exposed to “patients” from a variety of ethnic groups and age levels. The disadvantage to Dedicated Patients is that the student cannot ethically subject these actors to sticks from needles and tubes, etc.

One advantage to modern simulation is that it can be shared by many disciplines. At McGill University, the simulation center is shared by the nursing school, the medical school, the physical therapy school, the occupation therapy school, the speech & language pathology school, the dental school, and eventually the social work school.

Some uses for simulation include

1. Formative evaluation of students. Seeing themselves on videotape is one of the best tools for student self-evaluation that I have witnessed.
2. Summative evaluation of students. This is especially valuable for nursing, where much of the criteria for passing involve a blending of psychomotor skills and intellectual knowledge.
3. Opportunities for instructor self-evaluation. Sometimes when the instructor sees himself or herself on the taped video, it is very revealing.
4. Admission testing, when interpersonal and professional skills are being evaluated as well as grade point average.
5. Simulation can be used by students to challenge that their instructors were incorrect in their assessment of a student's clinical safety. It can also be used by the instructors to prove that they were right about student performance.
6. High Fidelity Simulation areas can be rented out to local hospitals for their staff trainings and certifications in Basic Life Support, Advanced Life Support, or other teaching areas that the hospital does not provide.
7. A Live Broadcast Skills center can be rented out to for medical or nursing educational workshops or conferences. When I was at McGill, a neurosurgeon was using the Skills Center to demonstrate the latest surgical technique for a hypophysectomy.
8. Simulation can also be used to evaluate faculty or staff team dysfunction. Team interactions can be videotaped and then reviewed by that team. In

one situation, a group of paramedics who could not function well together was able to ascertain the problem using simulation.

### Conclusion

Modern simulation techniques in nursing schools have arrived very suddenly. Most nursing schools now have simulation mannequins; many are unsure how to use them. It's not uncommon for a nursing school to have bought the equipment and not yet unpacked the boxes. It's important that Lane Community College School of Nursing stay abreast of this new technology, and incorporate lower fidelity forms of simulation, so that we can continue to provide high level educational experiences for our nursing students.