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The Use of Simulation in the Clinical Education of Radiation Science Students

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INTRODUCTION
Radiation science education students are considered to be adult learners. According to Fanning & Gabai, adults learn best through experiential learning. Experiential learning actively engages the student by providing them with the ability to participate and play a role in the acquisition of knowledge. Simulation in medical education is a practical approach which allows adults to learn experientially. The goal of simulation is not to substitute for actual clinical experience, but to replicate these clinical scenarios for the purpose of assessment of skill and feedback of the activity. Reform in education and medicine, along with the pressures associated with patient safety, have promoted the utilization of simulation in medical education. Team-based learning and inter-professional collaboration can also be fostered in a simulated setting. There are many approaches to simulated clinical education; three current methods will be addressed in this exhibit. These three methods include:

1) Utilization of a clinical skills lab manikin
2) Virtual simulation
3) Use of Standardized Patients

Clinical skills lab manikins
CLINICAL SKILLS LAB MANIKINS
High Fidelity manikins have the capability to breathe, bleed, urinate and speak. The manikins are anatomically correct and can be programmed to react to a variety of treatments given by the student. Studies show that students who use simulators improve on skill performance.

There are several ways in which radiation science students could benefit from the use of manikins. A simulated trauma scenario in which radiographers work as a team with students from clinical lab science, nursing, physician assistant or medicine is just one example. Other simulation equipment pertinent to radiation science students. Other simulation equipment pertinent to radiation science students include: Foley catheter manikins, IV arms, and arterial puncture arm and wrist. The clinical lab setting can be beneficial for psychomotor skills as well as critical thinking and cognition. Skills can be learned, practiced and perfected prior to applying them clinically in a stress-induced environment. Figure 1 illustrates an example of a high fidelity manikin being used in a simulation setting.

VIRTUAL SIMULATION
Virtual simulation or computer-based simulation is another option for use in clinical education. The United States Medical Licensing Examination (USMLE) and the American Board of Family Practice use simulation for examinees. Psychomotor skills can be enhanced in a virtual setting where time and patient constraints are not an issue. Repetition of movements and manipulation of equipment will quicken clinical procedures.

Critical thinking is addressed by using virtual anatomy to understand how radiation affects surrounding tissues while practicing techniques to minimize radiation to normal tissue.

STANDARDIZED PATIENTS
Standardized Patients (SPs) are individuals trained to portray specific clinical cases in a manner that is consistent and measurable. SPs provide real-time feedback on the quality of care provided. The use of SPs is an excellent tool for evaluating communication skills.

There are several ways in which radiation science students could benefit from the use of SPs. A simulated trauma scenario in which radiographers work as a team with students from clinical lab science, nursing, physician assistant or medicine is just one example. Other simulation equipment pertinent to radiation science students. Other simulation equipment pertinent to radiation science students include: Foley catheter manikins, IV arms, and arterial puncture arm and wrist. The clinical lab setting can be beneficial for psychomotor skills as well as critical thinking and cognition. Skills can be learned, practiced and perfected prior to applying them clinically in a stress-induced environment. Figure 1 illustrates an example of a high fidelity manikin being used in a simulation setting.

DEBRIEFING
Issenberg et al (in Fanning & Gabai) note feedback (including debriefing) to be the most important aspect of simulation based medical education. The debriefing process allows for facilitated and guided reflection as part of the experiential learning cycle. The main objective of the debriefing session is to reflect on the simulation experience, discuss it with others in a non-stressful, supportive climate and then learn/modify behavior based on the experience.

CONCLUSION
It is evident that simulation can be a beneficial tool in the education of radiation science students. By providing students with a direct, interactive learning situation in a risk-free learning environment, educators can better prepare them for real life clinical situations.

REFERENCES