

EDUCATION ARTICLE

Syracuse Perfusion School Profiles a New Paradigm in Perfusion Education During its TEAM SUNY Conference

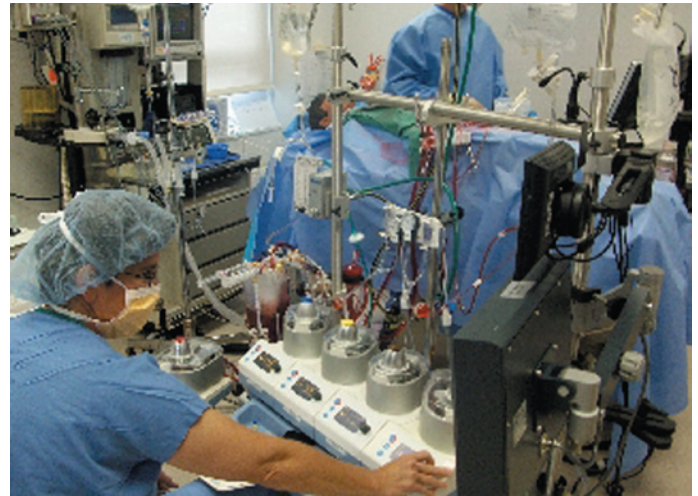
On September 9-12, 2010, over 70 individuals from 16 different states attended the TEAM SUNY 2010 Conference on the campus of the SUNY Upstate Medical University in Syracuse NY. This year's TS (TEAM SUNY) Conference, the seventh installment of the biennial meeting, awarded up to 33.3 Category 1 CEUs to participants and provided individualized high-fidelity perfusion simulation sessions to a few brave perfusionists. Indeed, the buzz word at this meeting was simulation and the participants not only heard about it, but a lucky few actually performed a complete simulated CABG X 3 procedure, experiencing the heart-pounding thrill of the SUNY simulator. "Look at me, that felt so real I am sweating!" said one CCP from Virginia as he left the OR. Mark was one of eight individuals that volunteered to participate in SUNY's data collection effort to benchmark the performance scores of certified perfusionists on their standardized surgery scenarios. Other highlights of the meeting included the talks of Daniel FitzGerald, Chief, Brigham and Women's, Boston and Mark Campbell, SUNY Alumni class of 1984 as the Distinguished Clinical Affiliate and Distinguished Alumni speakers invited to participate in the Jeanne Lange Memorial lecture series. "I always look forward to the Lange lectures", said Scott Alexander, chief at SUNY's University Hospital and long time colleague of Jeanne's. In 1974, Jeanne Lange founded the perfusion school at SUNY and was well known for the professional mentorship of her students. "We reserve a little time at every TS meeting to remember Jeanne and all that she did for our field and this program." said Bruce

Searles, Associate Professor and Department Chair of the SUNY program. "Her emphasis on professionalism has become a cornerstone of our training here in Syracuse and the Lange Lecture series is an excellent way to provide our affiliates and alumni a vehicle for discussing professional attitudes and behaviors with their peers and our students."

According to Bruce Searles, the TS Conferences are hosted every other year by the Perfusion School at SUNY Syracuse towards three primary goals:

1. **To say thank you to their clinical affiliates and SUNY alumni for their generous support of or program.** The registration fee for the TS conferences is FREE to SUNY Alumni and Clinical affiliates. "This is the least we can do for our supporters. Our program runs on the donations of time and supplies that these individuals provide, so we set aside one weekend every two years to host a quality meeting and give them free category 1 ABCP Points."
2. **To make the public aware of the SUNY perfusion school, their campus, curriculum, resources and students.** "The more the perfusion community associates quality with the SUNY product, the greater the opportunities that our students have after graduation. The TS Conference is one way to profile the SUNY program to the public. Additionally, the meeting serves as a great focus group through which we gather a lot of valuable feedback that we use to help improve our program."
3. **To provide the SUNY students an opportunity to be involved in all aspects of a large professional conference.** "The students are the backbone of our meeting. They do everything from managing the registration desk and hotel reservation issues, to managing the catering and presenting their research. This is a great opportunity for students to see what goes into hosting a professional conference and hopefully, they will learn from the experience and choose to support their local meetings or even national meetings once they are in the field."

This year, the TS Conference became the first professional conference ever to award Category 1 ABCP Points for participating in high fidelity simulation. "At Syracuse, simulation is more than just a new tool for perfusion education. It is a new paradigm for how we teach perfusion." said Edward Darling, Associate Professor at the SUNY program. "The technology is so true to life that we believe, when appropriately applied as an educational technique, that the students actually learn more and do more during their simulation rotations than they can do in clinical rotations during the first three semesters of the curriculum. Our research is demonstrating that the virtues of high fidelity simulation may lead to accelerated command of clinical skills in the early stages of training." (see sidebar figures) This should make it safer for patients and less stressful for clinical instructors when students begin practicing their craft at their clinical affiliate's operating rooms. Searles also stated, "Certainly, simulation compliments,



EDUCATION ARTICLE



The initial results of a pilot study conducted in the SUNY simulation center suggest that the techniques for simulation and evaluation that they are developing can differentiate individuals based on their skill level. The graph above illustrates different average performance scores for 4 different groups: First year students without simulation training (JR-NOSIM), First year students with simulation training (JR+SIM) Second year students with more than 100 clinical cases but no simulation training (SR-NOSIM) and Certified Clinical Perfusionists (CCP)

not replaces, actual clinical experiences ... our students in the third, fourth and fifth semesters will continue to do clinical rotations with at least four different hospitals and graduate with 120-200 actual cases."

High-fidelity Perfusion Simulation for Continuing Education

During the meeting, Searles and Darling demonstrated high fidelity simulation and the objective evaluation rubrics used to measure clinical skill. Additionally, they spoke about applications of high fidelity simulation including some very exciting programs they are rolling out as part of their Simulation Based Continuing Education Programs:

Basic Skills Introduction/ Refresher for Perfusionists

Clinicians interested in practicing basic skills that they are not familiar with before they use them in the operating room, can attend a skill refresher course. Has it been 20 years since you used a centrifugal pump? Are you contemplating the use of VAVD or RAP at your institution? Do you want to run a few cases with your electronic data management system before you have to use it with a patient? You can practice these and other skills in a high fidelity environment. Through simulation, you can practice good technique and fully explore and understand the ramifications of bad techniques before you have to use the skills on your patients.

Re-CCP

Re-entry into a perfusion career is par-

ticularly difficult once ABCP certification has been lost. Individuals who have let their certification lapse must perform 50 clinical cases to become eligible to take the ABCP exam. Searles explains, "It is often very difficult for these people to find anyone who will hire them without their certification and recent clinical work, and without the recent clinical work they can't take the exam. It's a circular argument." High-Fidelity simulation is an essential element of a program that SUNY offers to develop a pathway for formerly certified perfusionists to become eligible to re-take the certification exam. In this program, individuals may enroll in several weeks of simulation training to refresh their skills and become reacquainted the clinical

equipment and environment. Once a threshold level of proficiency has been documented in the simulation lab, the candidate can be sent on a clinical rotation to perform the required 50 cases needed to take the certification exam.

Crisis Management Training for Perfusionists

In this program, both individuals and teams can be trained in the management of low frequency crisis events. Crisis protocols for pump failure, oxygenator failure, air embolus, aortic dissection and others can be practiced and refined in the realistic high-fidelity environment.

Risk Management Training for Perfusionists

Where crisis management focuses on how to get out of trouble, risk management focuses on how to stay out of trouble. Through lecture and simulation, the participants are prepared to reduce their risk of developing a crisis through thoughtful application of prepared protocols, clear communication and documentation.

Hands-on CPB for Residents and Fellows

Physicians such as cardiac surgery and anesthesiology residents and fellows can gain a more complete understanding of cardiopulmonary bypass through demonstrations and hands-on learning exercises. The field of anesthesia is ahead of most other medical disciplines in their acceptance and application of simulation. "These doctors can learn more in one day in the

Continued on page 9

VIRTUES OF HIGH-FIDELITY SIMULATION

1. Student-focused environment / not patient-focused
2. Opportunity to make mistakes and learn from them without harming a patient
3. Opportunity to master modular skills through repetition
4. Opportunity to evaluate students' practical understanding of key concepts
5. Opportunity to perform low-volume high-risk events at high frequency
6. Opportunity to compare students' clinical performance against known benchmarks for experienced perfusionists
7. Enhanced post-case debriefing by allowing the student to watch their recorded performance

NEW MEMBERS

Justin T. Savage	Glendale, AZ
Aaron A. Schreck.....	Phoenix, AZ
Ronald Smith.....	Charleston, SC
Alexandra C. Snyder	Charleston, SC
Emily Stockard.....	Houston, TX
Natalija G. Tauginas CCP.....	Wheaton, IL
Stephen E. Thomas.....	Redding, CT
Scott Thompson	Fayetteville, NY
Emily L. Thunstrom.....	Franklin Square, NY
Randy L. Torres	East Norwich, NY
Armando Vega.....	Hialeah, FL
Brian D. Walker	Portland, OR
Edward D. Whitehead.....	Hamden, CT
Savannah Williams	Mount Pleasant, SC
Marisa Young.....	Bowling Green, KY
Rebecca Zurawski	Hamden, CT

Education Article

Continued from page 5

in the heart room because they are free from the responsibility of patient care and can actually touch the equipment, turn the knobs and move the clamps to develop a much more thorough appreciation of extracorporeal technologies”

Hands-on CPB for Industry

Individuals in industry who design, develop, build, service or market products for use in the operating room, particularly for use during open heart surgery, are often interested in gaining a better understanding of what goes on in the heart room. “Industry reps have lots of questions that we can help answer. What do perfusionists do? How do perfusionists use this device? What is the communication like between the surgeon, anesthesiologist and perfusionist once you are on pump? Through simulation, we can create a customized OR experience that answers their questions in a low stress environment.”

The remodeling of the perfusion classrooms into a simulated OR, pump room, supply room, clinical skills office and debriefing rooms was part of a \$750,000 renovation of Silverman Hall in the College of Health Professions. The SUNY simulation OR is equipped with multiple video cameras and microphones. Everything that is said and done in the room is digitally captured for review. “Our students can learn from every case multiple times, by watching their performance on the computer. The cameras can be zoomed in tight to read a manometer, or a reservoir level or any fine detail that is needed for an effective debriefing.” Currently, plans are underway for a new academic building on the SUNY Upstate Medical University campus which will house a state of the art simulation facility for all of the university’s colleges. As part of this project, the perfusion departments simulation footprint is planned to expand to accommodate an anticipated increased usage.

Searles summarized with this, “While we have just begun to scratch the surface, it is clear that the potential for using simulation as an educational technique is enormous. It is exciting to see the perfusion communities’ enthusiasm for this next step in our professions development.”

More information is available on their web site: <http://perfusion.upstate.edu/simulation>.

NOVEMBER/DECEMBER THEME #2

Modified Ultrafiltration Technique in the Pediatric Patient

By **Mat Medlin RRT BS CCP LP**
Savannah, GA



Mat Medlin RRT BS CCP LP

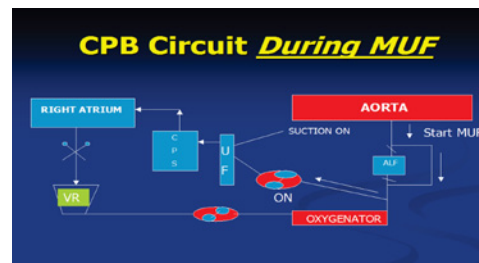
A number of adverse effects are associated with the use of cardiopulmonary bypass (CPB) in the pediatric patients undergoing cardiac surgery. Capillary permeability leads to an increase in total body water with subsequent edema formation. Pulmonary compliance and gas exchange are decreased, and myocardial edema may result in diastolic dysfunction. Conventional efforts to reduce the detrimental effects of

capillary leak syndrome after CPB include reducing circuit prime volumes, modified ultrafiltration (MUF), retrograde autologous prime, colloids, diuretics, anti-inflammatory therapies, and postoperative diuresis.

Modified ultrafiltration (MUF) is an alternative method to reduce the adverse effects of hemodilution during CPB. MUF is performed immediately after the cardiopulmonary bypass period. Studies with MUF have demonstrated decreases in total body water, improvement in myocardial function, increase in cerebral oxygenation after circulatory arrest, reduced blood loss/transfusion rates and significant increases in patient’s hematocrit.

The procedure is performed immediately post-bypass for 10-15 minutes or until a desired hematocrit value is achieved. The blood from the patient’s aorta flows retrograde down the arterial line and into the ultrafiltration circuit (approximately 10 to 30 ml/kg/min of blood). The blood is diverted through a hemoconcentrator and then reinfused to the patient’s right atrium.

Multiple studies have documented the effectiveness of MUF in ameliorating many of the undesirable effects of CPB. MUF improves hemodynamics, reduces total body water, and decreases the need for blood transfusions.



MUF has been shown to increase intrinsic LV systolic function, recover diastolic compliance, increase blood pressure, and decrease inotropic drug use in the early postoperative period.

The care of children undergoing cardiovascular surgery provides a remarkable challenge to the perfusionist. In the last decade, improvements in diagnostic capability, CPB techniques, monitoring, and perioperative care have permitted more complicated procedures to be performed on smaller, sicker children with remarkable success. Perfusionists caring for these patients must be flexible and innovative. Perfusionists must have an individualized plan for each pediatric patient undergoing a complex cardiovascular procedure. Being a part of a successful team effort and caring for these patients are among the most exhilarating and gratifying experiences in surgery today.

