Crisis Management in Office-Based Anesthesia

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(Note: The introduction of CRM into health care is generally credited to Dr. David Gaba [see Ref: Gaba], who has written a book entitled "CRM in Anesthesiology", describing many of the following issues in greater detail.)

HISTORY

While the idea of simulation goes back many centuries, modern simulation began with Edward Link who constructed and later marketed the first aircraft simulator in Binghampton (New York). Initially supported by purchases from the army, this new tool was soon embraced by commercial aviation, especially after mandatory certification was implemented by the Federal Aviation Administration (FAA). Even though simulation was expensive, it provided a cheaper way than training and certification in real aircrafts.

A significant shift in the use of simulation occurred when United Airlines - following the analysis of several airline crashes in the 1970s which documented lethal decision-making errors by individual crew members or the cockpit team itself - first adopted the concept of training their flight crews in simulator-based crisis management. The use of realistic flight simulators allowed airline crews to practice not just the "nuts and bolts" of managing crisis such as engine fires, but especially how to work together optimally as a team.

SIMULATION IN HEALTH CARE IN NORTH AMERICA

Initial attempts (in the 1960's) to design a medical simulator were limited due to a lack of computer technology. Twenty years later two centers began to work on the development of full-scale, high-fidelity simulators: Dr. Good (University of Gainsville, Florida) and Dr. Gaba (Stanford University, Palo Alto) - both anesthesiologists. Since then, simulation has experienced an unprecedented growth and most major medical centers in North America have now adopted simulation in their curricula.

More recently, in an effort to provide a measure of consistent quality for simulation courses across North America, the American Society of Anesthesiologists (ASA) started a program of simulation center endorsement. The participation in a simulation course at an ASA-endorsed simulation center is now a component of the 4th part (Practice Performance Assessment and Improvement, PPAI) of the Maintenance of Competence in Anesthesia (MOCA) program by the American Board of Anesthesiology (ABA).

OFFICE-BASED ANESTHESIA SIMULATION

Office-based anesthesia is a rapidly-emerging trend and requires a different skill set than hospital-based anesthesia. Due to the lack of resources in offices (compared to hospitals), special considerations for practitioners apply and simulation could prove to be an invaluable tool for training office-based healthcare providers in the management of critical events.

Currently the majority of simulation centers focus on the provision of anesthetic services in hospitals (in fact, most simulation centers are set up directly in a hospital facility). Realistic simulation courses in actual free-standing, office-based facilities (or which could simulate that environment) are only slowly becoming available. Table 1. lists the currently ASA endorsed centers and their ability to offer office-based simulation Crisis Resource Management (CRM) courses.

SIMULATION CENTER	CONTACT	OBA SIM?
Cooper Simulation Laboratory C/O Department of Anesthesiology 1 Cooper Plaza, Cooper University Hospital, Camden, NJ 08103	Gregory Stamen (856) 968 7892	no
Center for Medical Simulation 65 Landsdowne Street, Cambridge, MA 02139	Reception: (617) 768-8900 info@harvardmedsim.org http://www.harvardmedsim.org/	no
Texas Tech University Health Sciences Center Department of Anesthesiology 601 4th Street, MS 8182, Lubbock, TX 79430-8182	Sharon Decker: (806) 743-2730 x356 Sharon.Decker@ttuhsc.edu	no
Stanford School of Medicine Center for Immersive and Simulation-based Learning Stanford School of Medicine, Mail Code 5412 251 Campus Drive, Stanford, CA 94305-5412	Sandra Feaster: (650) 862-5807 sfeaster@stanford.edu	no
Stony Brook University Medical Center Clinical Skills Center Stony Brook University Medical Center HSC Level 2, Room 180, Stony Brook, New York 11794-8220	Chris Gallagher (631)444-2098	no
University of Utah Anesthesiology Department Center for Patient Simulation, Dept. of Anesthesiology	Diane Tyler: (801) 581-6393	no

E Room – 3C444, Salt Lake City, UT 84132-8501	Diane.Tyler@hsc.utah.edu	
HELPS Center **Human Emulation, Evaluation, and Education Lab for Patient Safety** Klingenstein Clinical Center Building, Mount Sinai School of Medicine Department of Anesthesiology, Eighth Floor 8-04 1450 Madison Avenue (between 99-100), New York, NY 10029	Adam Levine: (212) 241-1518 adam.levine@mssm.edu	Information not available
University of Texas Medical Branch at Galveston Patient Simulation Center, University of Texas Medical Branch at Galveston Department of Anesthesiology, 301 University Blvd - Route 0591 Galveston, TX 77555	Maura Boyle: (409) 747-8790 mjboyle@utmb.edu	No mobile courses offered at this time, but have hardware for it
University of Virginia Health System University of Virginia Health System Medical Simulation Center PO Box 800699 Charlottesville, Virginia 22908	Reception: (434) 924-2566 medicalsimulationcenter@virginia.edu	Information not available
Washington University in St. Louis School of Medicine Howard and Joyce Wood Simulation Center Department of Anesthesiology, WUSM 660 S Euclid Avenue St Louis, MO 63110	Julie Woodhouse: (314) 747-2136	no
University of California, San Francisco UCSF Department of Anesthesia and Perioperative Care Anesthesia Simulation Center, San Francisco General Hospital Building 30, Rm. 3203, 1001 Potrero Avenue, San Francisco, CA 94110	Armando Leiva (415) 206-3250	No
Northwestern University Northwestern Center for Clinical Simulation Department of Anesthesiology, Northwestern University Feinberg School of Medicine 251 E. Huron St, F5-704, Chicago, IL 60611	Christine Park: (312) 926-8105	no
Peter M. Winter Institute For Simulation Education and Research WISER, University of Pittsburgh 230 McKee Place - Suite 300, Pittsburgh, PA 15213	Kayla Stalma (412)648-6073 phrampuse@upmc.edu	no
Institute for Simulation and Interprofessional Studies ISIS, University of Washington 1959 NE Pacific Street, Box 356410 Seattle, WA 98195	Megan Sherman: (206) 598-2710	no
Oregon Health & Science University OHSU Anesthesia Simulation Services Attention: Erin Dobin Mail code UHS-2, 3181, Sam Jackson Park Road, Portland, Oregon 97239	Michael Seropian (503)936-9337 youkerl@ohsu.edu	no

[Pennsylvania State University College of Medicine](#) Penn State Hershey Clinical Simulation Center 500 University Drive, PO Box 850 Hershey, PA 17033-0850	Jody Wood: (717) 531-0003 x287661	'off-site' simulations (MRI) but no mobile courses
[University of Chicago](#) Department of Anesthesia and Critical Care University of Chicago Center for Simulation 5841 South Maryland Avenue, MC 4028, Chicago, Illinois 60637		Information not available
[University of Miami – Jackson Memorial Hospital Center for Patient Safety](#) 1611 NW 12th Ave. Miami, FL 33136	Ilya Shekhter (305) 585-6970	no
[UCLA Simulation Center](#) UCLA Simulation Center, Learning and Resource Building (LRC) A Floor 700 Westwood Plaza - Room A222 LRC, Los Angeles, CA	You Ming: (310) 267-2114 yhuang@mednet.ucla.edu	Through dental school only (but not mobile)
[Mayo Clinic – Rochester](#) Mayo Clinic Multidisciplinary Simulation Center Stabile Building, First Floor, 200 First Street SW, Rochester, MN 55905	Lisa Banks (507)284-2511	no
[Vanderbilt University](#) Simulation Technologies Program 2213 Garland Ave, 3450MRB IV, Nashville, TN 37232	Ray Booker (615)936-8840	no

Table 1. 2010 ASA endorsed centers and their ability to offer office-based simulation CRM courses (last updated October 2010)

Individuals interested in establishing a simulator course for office-based anesthesia crisis management are encouraged to explore possible collaboration with existing simulation centers. One option would be to ask the center if they may simply be willing to rent out a non-tethered mannequin (fully transportable) along with basic AV-equipment and a technician plus instructor. This equipment and team could be relocated to an office (preferably on the weekend in order to not disrupt patient care during regular business hours) for an office-based CRM course.

As an alternative it may be possible to run simple 'drills' (i.e. evacuation, cardiac arrest, anaphylaxis) by contracting a vendor of simulation mannequins who may be willing to provide the hardware and technical expertise to 'run' the group simulation. It may be possible to recruit an expert instructor from a nearby simulation center to assist with such a workshop. It may be economically feasible for several office-centers together to purchase and share basic simulation equipment in order to offer their staff such courses on a more regular basis.

Significant concerns exist regarding the use of props (such as fake or outdated medications and equipment etc) during simulations in actual patient care areas. If a simulation is held in an actual office facility, the staff must ensure that none of these items are left behind an used for subsequent patient care. While more expensive, it may actually be preferable to use real equipment and medications for

simulations in office facilities (and not to bring any props). The additional cost for various supplies is relatively small compared to the risk of patient harm except for perhaps in the case of running MH scenarios (due to the price of Dantrolene).

There are a number of simulator instructor courses offered at various endorsed centers across North America, including special workshops on debriefing, technical expertise and educational theory. Crisis management debriefing techniques differ from traditional teaching methods and novice instructors often report this to be the most challenging aspect of instructors' expertise. Likewise, participants' rating of course quality frequently correlates with the perceived skills of the debriefing.

SUMMARY

While most simulation-based CRM currently takes place in hospitals, portable equipment has made it possible to bring simulation directly into actual offices. This represents a unique and extremely valuable opportunity to improve safety especially for office-based anesthesia.

References and Resources:

Gaba et al: Crisis Management in Anesthesiology ed: Churchill Livingstone, 1994

Chopra et al: Does training on an anaesthesia simulator lead to improvement in performance? BJA 1994; 73: 293-297

http://www.apsf.com.au/crisis_management/crisisframe1_frame1.htm

http://qshc.bmj.com/cgi/content/full/14/3/e1