

**Peter M. Winter Institute for Simulation Education and Research (WISER)  
Staff**

**John J. Schaefer III, M.D., Associate Professor  
Anesthesiology Director,**  
Peter M. Winter Institute for  
Simulation Education and Research

**Jacqueline Gaines, Administrator**  
Peter M. Winter Institute for  
Simulation Education and Research

**Thomas Dongilli, Operations Coordinator**  
Peter M. Winter Institute for  
Simulation Education and Research

**John Lutz, Information Technology Coordinator**  
Peter M. Winter Institute for  
Simulation Education and Research

**Christine Barton, Sr. Simulation Specialist**  
Peter M. Winter Institute for  
Simulation Education and Research

**Jon Mazur, Simulation Specialist**  
Peter M. Winter Institute for  
Simulation Education and Research

**Delisse Warren, Administrative Assistant**  
Peter M. Winter Institute for  
Simulation Education and Research

**BJ Hosler, Lead Systems Analyst**  
Peter M. Winter Institute for  
Simulation Education and Research

**Ake Grenvik, M.D., Ph.D., (Chair)**  
Distinguished Service Professor of Critical Care Medicine

## Appendix C

### Peter M. Winter Institute for Simulation Education and Research (WISER) Course Directors

**Susan Dunmire, M.D., Associate Professor  
Emergency Medicine**

**Melinda Fiedor, M.D., PEDS  
Critical Care Medicine Post Doctorate Scholar**

**John J. Schaefer III, M.D., Associate Professor,  
Anesthesiology Director,  
Peter M. Winter Institute for  
Simulation Education and Research**

**Michael De Vita, M.D., Associate Professor  
Critical Care Medicine**

**Samuel Tisherman, M.D., Associate Professor  
Critical Care Medicine and Surgery**

**Michael H. Mohr, M.D., Visiting Instructor  
Anesthesiology**

**Andrew W. Murray, MB CHb  
Visiting Assistant Professor Anesthesiology**

**John O'Donnell, CRNA, MSN  
Director,  
Nurse Anesthesia Program  
University of Pittsburgh School of Nursing**

**William McIvor, M.D., Assistant Professor  
Anesthesiology**

**Paul L. Rogers, M.D., Professor  
Critical Care Medicine**

**Erin Sullivan, M.D., Associate Professor  
Anesthesiology  
Director, Cardiothoracic Anesthesiology  
Associate Chief Anesthesiologist, UPMC, PUH**

**Ramesh Venkataraman, M.D., Assistant Professor  
Critical Care Medicine**

**Amy Seybert, Assistant Professor of Pharmacy  
Pharm D**

**Patti Campbell, Assistant Director  
Advanced Clinical Education Center  
Office of Medical Education**

**Aneal S. Gadgil, Fellow  
Pulmonary and Critical Care Medicine**

**Paul Kempen, M.D., Associate Professor  
Anesthesiology  
Critical Care Medicine**

**Ryan Romeo, M.D., Assistant Professor  
Anesthesiology**

**Sandy Sell, MSN, CRNA  
Critical Care Medicine**

**Paul Phrampus, M.D., Assistant Professor  
Emergency Medicine  
Assistant Director, Emergency Medical Programs  
Peter M. Winter Institute for Simulation Education and  
Research**

**Debbie Solvay, Unit Director  
Critical Care Unit and Intensive Care unit**

**Walt Stoy, Ph.D., Professor  
Director, Emergency Medicine**

**Joseph F. Talarico, D.O., Assistant Professor  
Anesthesiology**

**Joe Suyama, MD, RaPID-T WMD Training Program  
For First Responders, Emergency Medicine  
Center for Emergency Medicine**

**Gretchen Zewe, RN MNEd  
University of Pittsburgh  
School of Nursing**

## Appendix D

### Peter M. Winter Institute for Simulation, Education and Research (WISER) Course List FY05

#### Anesthesiology

ACLT ANES RES SRNA  
CA1 ANES INTRO  
DAM ANES RES  
FOB ANES RES  
MISC Training - ANES

#### Critical Care Medicine

CCM FELL ORIENT  
DAM CCM FELL  
DAM FOB CCM FELL  
MISC Training - CCM  
MISC Training - PED

#### Emergency Medicine

AIR MED CREW  
MISC Training - EM

#### Pharmacy

Pharm 5221

#### Respiratory Therapy

MISC Training - RT

#### School of Medicine

2ND YR ANES CLIN PROC  
2nd YR ANES MON  
3RD YR ANES A/W GET (D1)  
3RD YR ANES EKG  
3RD YR ANES EMER SURG (D3)  
3RD YR ANES IND GET (D2)  
3RD YR ANES PERIOP EMER (D4)  
3RD YR CCM  
4TH YR ANES ADV A/W MNG  
4TH YR ANES NEUR  
4TH YR ANES OB  
4TH YR ANES TURP  
4TH YR CCM  
4TH YR EM  
MISC Training - MS  
NURSAN 2740 (DLT/JV)  
OSCE AIMC  
OSCE CAMC  
OSCE CCA  
OSCE CSA  
OSCE CSA PD II

#### University of Pittsburgh Medical Center

CRISIS TEAM MKS  
CRISIS TEAM UPMC  
CVCT  
DAM PHCP  
Mock Code  
NUR SON FB  
RT Mini-BAL

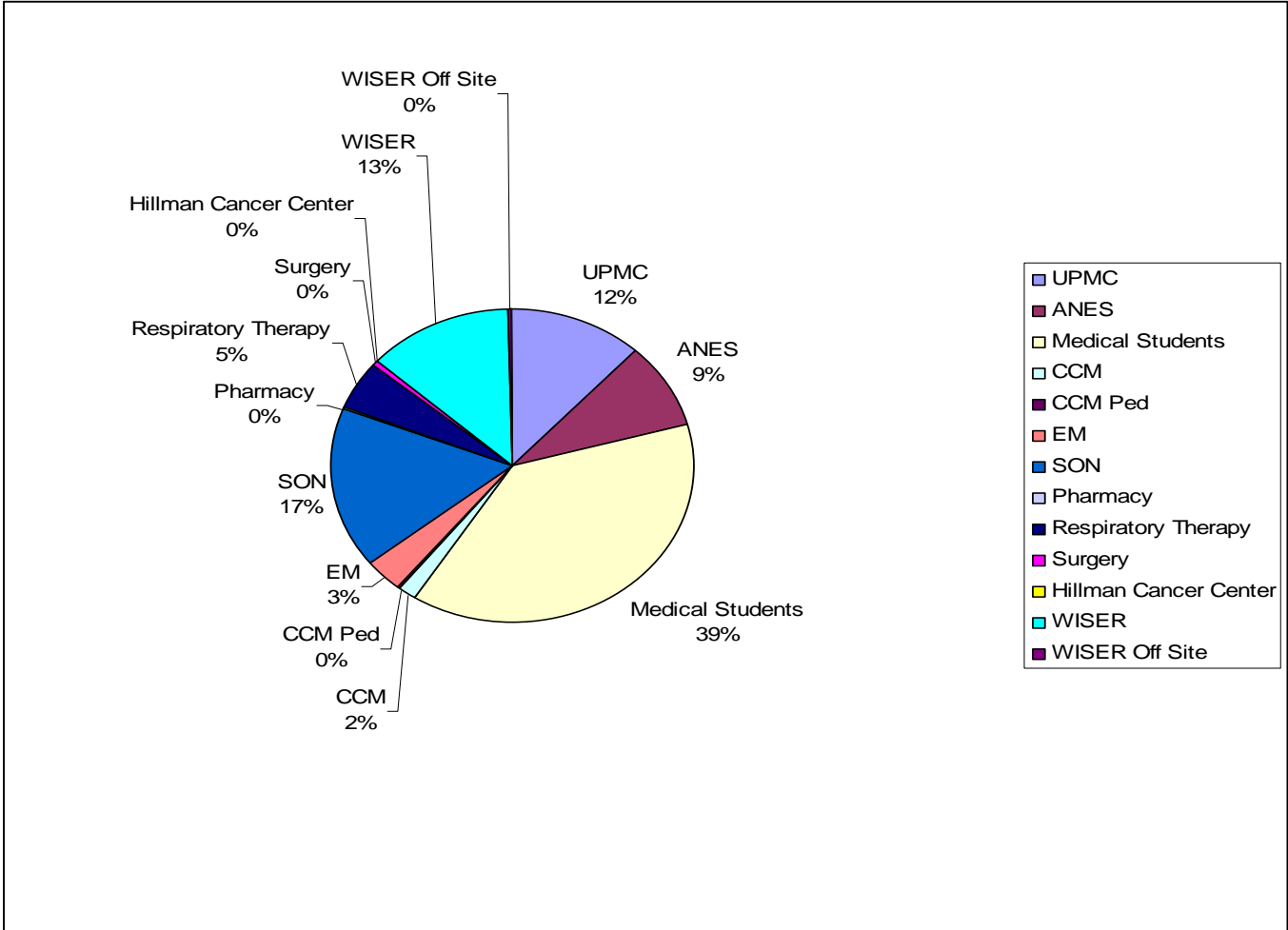
#### Peter M. Winter Institute for Simulation, Education and Research

ACLS - CME  
CRT & IMPL SLS & ASP  
Center Dsg, Dev and Oper FacI.  
DAM ANES FAC  
DAM CME  
DAM EM FAC  
DAM EM RES  
FACILTRN WISER FACIL  
FOB CME  
MISC Training - WISER  
RSCH DAM REP  
RSCH DAM RET  
SURG ACLT

#### School of Nursing

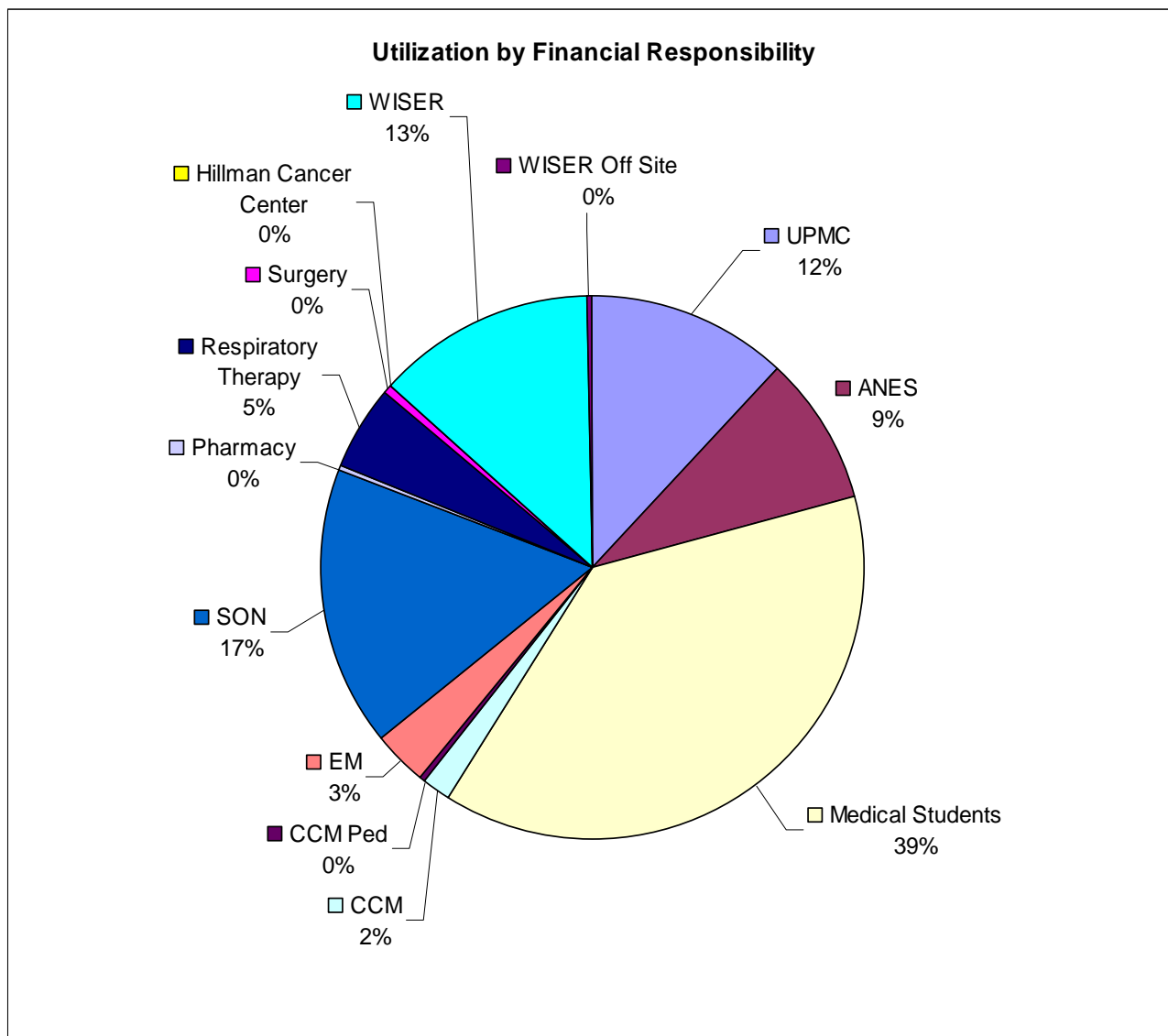
DAM ANES CRNA  
MISC Training - SON  
NUR 1050  
NUR 1052  
NUR 1120 - ADV  
NUR 1121 ADV  
NUR 1233  
NURSAN - SRNA PA  
NURSAN 2750 - CCI & S  
NURSAN 2750 - TRAUMA

**Peter M. Winter Institute for Simulation Education and Research (WISER) Utilization**



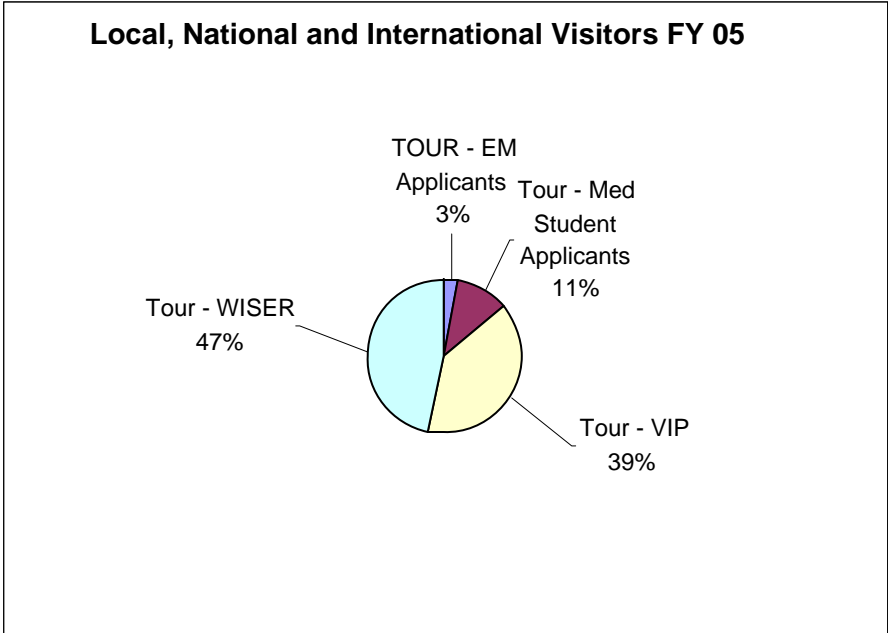
Courses	Hours
UPMC	1091
ANES	804
Medical Students	3471
CCM	165
CCM Ped	8
EM	318.5
SON	1513.5
Pharmacy	12
Respiratory Therapy	476
Surgery	43.75
Hillman Cancer Center	6
WISER	1180.75
WISER Off Site	25
<b>Total</b>	<b>9114.50</b>

**Peter M. Winter Institute for Simulation Education and Research (WISER) Utilization Continued**



Courses	Hours
UPMC	1091
ANES	804
Medical Students	3471
CCM	165
CCM Ped	8
EM	318.5
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Pharmacy	12
Respiratory Therapy	476
Surgery	43.75
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WISER	1180.75
WISER Off Site	25
<b>Total</b>	<b>9114.5</b>

**Peter M. Winter Institute for Simulation Education and Research (WISER)  
Local, National and International Visitors**



TOUR - EM Applicants	10
Tour - Med Student Applicants	40
Tour - VIP	139
Tour - WISER	166.5

**Peter M. Winter Institute for Simulation Education and Research (WISER)  
Local, National and International Visitors Continued**

VIP	Tour VA Health Systems	7/23/2004
*VIP	Doug Mamele - US AIR FORCE &v Tony Griego - LLC	8/12/2004
VIP	CDC / NIOSH Tour	9/7/2004
VIP	JJS Tour	9/8/2004
*VIP	Michener Institue for Applied Health Sciences	9/16/2004
*VIP	Memorial Hospital and Health System MI.	9/30/2004
VIP	Members of the Society for Critical Care Medicine	10/7/2004
VIP	SON Board of Visitors - John O'Donnell	10/13/2004
VIP	Senior Congressional Aides	10/13/2004
VIP	Tour Chancellor Nordenberg and Guests	10/15/2004
VIP	Tour with CEM for Visiting Japanese MDs	11/3/2004
VIP	WPIC Professional Practice Council	11/17/2004
VIP	AAMC / IHI tour - DeVita	12/1/2004
*VIP	General Wesley Clark and Laura Hagg	12/20/2004
*VIP	CCAC VP Tour	1/10/2005
VIP	Military Affairs Council Tour	1/12/2005
VIP	Mercy Faculty - Drs. Troianos, Freeman, Narduzzi.	1/19/2005
*VIP	Lt. Col. Kirschbaum (Wilford Hall)	1/24/2005
*VIP	University of Alabama , Birmingham	1/28/2005
*VIP	NorthWest Hospital, setting up Sim center	2/17/2005
	Richard P. Kidwell - Associate Counsel and Director of Corporate Risk	
VIP	Management for UPMC	2/18/2005
VIP	Gianfranco Micciche - Italy's Vice Minister of Finance	3/7/2005
*VIP	Michner tour	3/9/2005
*VIP	VP of Siemens and other VIPs	3/14/2005
VIP	FAS TOUR	3/18/2005
VIP	MDs from Japan that could not make the tour on the 10th of March	3/18/2005
VIP	Director or Nursing/Nancy Stitt UPMC/Palermo	3/30/2005
VIP	Medical School Advisor Tour	4/1/2005
VIP	Dr. Joshua Shemer - Loren Roth	4/14/2005
VIP	JJS to do tour for Center for Emergency Medicine	4/19/2005
VIP	Central South University, Xiangya 2nd Hospital	4/21/2005
VIP	Jason McBride MD, WISER capabilities, simbaby, ecmo - Ralph	4/25/2005
VIP	Hartford Hospital tour, Dr. Tom Mort, Steve Donahue	4/27/2005
*VIP	WISER/SimMedical Tour/Discussion(UPMC Site Visit)	4/29/2005
	Rhode Island Hospital Medical Simulation Center Dynamics Research	
VIP	Corporation	5/3/2005
VIP	PITT Photo Shoot - Office of Inst. Advancement	5/5/2005
VIP	NYU Chair of the Surg. Department - John Mahoney	5/6/2005
VIP	NBC Tour	5/11/2005
VIP	Laerdal Japanese Tour	5/12/2005
*VIP	Wilford Hall	5/13/2005
*VIP	CEO of Zoll	5/19/2005
VIP	Medical Alumnae Weekend	5/21/2005
*VIP	President of gaming company from Orlando, FI	5/25/2005
*VIP	Charleston Area Medical Center Health Education and Research Institute	5/27/2005
VIP	Trondheim, Norway - Simulation Centre	6/1/2005
*VIP	DDI - training company	6/27/2005
VIP	University of Nevada - Michele McKenney and Loren Roth	6/28/2005
*VIP	Tallahassee Community College	6/30/2005
	Medical Students Tour	9/13/2004

Medical Students Tour	9/14/2004
Medical Students Tour	9/17/2004
Medical Students Tour	9/20/2004
Medical Students Tour	9/21/2004
Medical Students Tour	9/24/2004
Medical Students Tour	9/27/2004
Medical Students Tour	9/28/2004
Medical Students Tour	10/1/2004
Medical Students Tour	10/4/2004
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Medical Students Tour	10/19/2004
Medical Students Tour	10/22/2004
Medical Students Tour	10/22/2004
Medical Students Tour	10/25/2004
Medical Students Tour	10/26/2004
Medical Students Tour	10/29/2004
Medical Students Tour	11/1/2004
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Medical Students Tour	2/4/2005	
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Medical Students Tour	3/14/2005	
Medical Students Tour	3/15/2005	
Medical Students Tour	3/16/2005	
Medical Students Tour	3/18/2005	
Medical Students Tour	3/21/2005	
Medical Students Tour	3/22/2005	
Medical Students Tour	3/25/2005	
Medical Students Tour	3/28/2005	
WISER	ANES Support Staff	7/1/2004
WISER	Career Camp - AAUD Aliquippa, Alliance Unity and Development - Ruthie King	7/6/2004
*WISER	Providence Hospital	7/7/2004
WISER	Pittsburgh Gateways - Purdue University Gateway Pr	7/9/2004
WISER	Medical School Development Office	7/12/2004
WISER	CCM Fellow Candidate - Moore	7/16/2004
WISER	PGH Gateways - Heinz Foundation - Brian Kelly	7/22/2004
WISER	AHEC Summer Health Career Academy	7/29/2004
WISER	AHEC Summer Health Career Academy	7/29/2004
WISER	UPMC Beckwith Fellows- David Patton & Kathy P.	8/3/2004
*WISER	Scenpro Co. & US Navy	8/3/2004
WISER	Chinesse Delagates - Paul Rogers	8/18/2004
*WISER	Henry Ford Hospital, MI - Sean Drake & Eric Scher	8/25/2004
*WISER	Robin Gaustad - Fairvue Health Services Minneopol	8/30/2004
*WISER	Dartmouth/Cerner (10 People)	9/21/2004
WISER	UPP Auditors/Witmer (Barton)	9/22/2004
*WISER	Ken Plitt Aspect Medical	9/24/2004
WISER	Laerdal Japan Pychicians	10/5/2004
WISER	UPMC Health Journal	10/7/2004
WISER	Connie Filer - Magee Womens Hospital	10/11/2004
*WISER	University of Texas Health Science Center	10/13/2004
*WISER	Carnegie Mellon (Xbox Crisis Team)	10/25/2004
*WISER	Dr. Mackett (TD)	11/3/2004
WISER	Civic Leadership Tour	11/8/2004
WISER	Anes Res Applicant Tour Anes Res. to do.	11/10/2004
WISER	WISER Tour Center of Bio- Security UPMC(JM,CB)	11/11/2004
WISER	Scott Weber & Nursing Education(JOD)	11/11/2004
WISER	Anes Res. Applicant tour Anes. Res. to do.	11/16/2004
WISER	Anes Res. Applicant tour Anes. Res. to do.	11/17/2004
WISER	Wiser Tour/ Associated Press-Jennifer Yates( TD)	11/18/2004

*WISER	Wiser Tour/ Michigan State( Dr.Hoppe)(TD)	11/19/2004
WISER	Jim Brucker - Exec. Director of UPMC Development	11/22/2004
WISER	Anes Res. Applicant tour    Anes. Res. to do.	12/1/2004
WISER	JOD - CRNA Tour	12/1/2004
WISER	J.B. McGee - TD	12/3/2004
WISER	Kenichi Sasaki - Tom Dongilli is the Tour Guide	12/3/2004
WISER	Nur/Anes program Applicants(JM,CB)	12/3/2004
*WISER	Gen.Kilpatrick JS/Steve	12/3/2004
*WISER	Mizrahi Design photo shoot for SimMedical IMMS	12/6/2004
WISER	Anes Res. Applicant tour    Anes. Res. to do.	12/8/2004
WISER	Nur/Anes program Applicants(JM,CB)	12/14/2004
WISER	Anes Res. Applicant tour    Anes. Res. to do.	12/15/2004
WISER	JOD 18 People	12/15/2004
*WISER	Cerner Corp. Tour - Scott Bailey	12/16/2004
WISER	Tour EM Applicants	12/16/2004
*WISER	Andy Herlich / Temple Univ. see internal	12/16/2004
*WISER	Cerner Corp. - Scott Bailey	12/17/2004
WISER	Nur/Anes program Applicants(JM,CB)	12/17/2004
WISER	Boris M - John Williams requested(TD)	12/17/2004
WISER	Anes Res. Applicant tour    Anes. Res. to do.	12/21/2004
WISER	Anes Res. Applicant tour    Anes. Res. to do.	12/22/2004
WISER	Dr. Franklyn Claudis (Pediatrics) (TD)	12/22/2004
WISER	22 Respiratory therapy students - Al Augustine	1/6/2005
WISER	Nur/Anes program Applicants(JM,CB)	1/7/2005
WISER	Anes Res. Applicant tour    Anes. Res. to do.	1/12/2005
WISER	Tour EM Applicants	1/13/2005
WISER	Anes Res. Applicant tour    Anes. Res. to do.	1/19/2005
*WISER	Tour for Cecilia Holm, Dr. Lars Bjork, Dan Paul.	1/19/2005
WISER	Nur/Anes program Applicants(JM,CB)	1/21/2005
WISER	Pack 288 Boy Scouts (TD)	1/22/2005
WISER	CEO of the Oncology Nursing Society&staff members	1/24/2005
*WISER	Ataturk University (Turkey)	1/24/2005
*WISER	Geisinger Medical Center in Danville (TD)	1/27/2005
WISER	Nur/Anes program Applicants(JM,CB)	1/28/2005
WISER	Sten Rubertsson of Uppsala - Ake	1/31/2005
WISER	CCM/Ped EM (Tom)	1/31/2005
WISER	Survivors of Sudden Cardiac Arrest - Mary Newman(Center for early Defibrillation)	2/1/2005
WISER	Tour/ SHRS Clinical Coordinators (CB,JM)	2/3/2005
WISER	Nurs/Anes applicants	2/4/2005
WISER	Tour Corp.Communication.    TD to do	2/8/2005
WISER	Nurs/Anes applicants	2/11/2005
WISER	Nurs/Anes applicants	2/17/2005
WISER	Junior Achievement - Franki Williams	2/18/2005
WISER	20-25 Students Punxsutaway High-Ruthie King(CB)	2/23/2005
WISER	Cynthia McCabe/William Dunn and party Mayo Clinic (JJS,TD)	2/25/2005
WISER	PJ EM PHCP (Japanese Tour)(TD)	3/11/2005
WISER	Clarion University Educational Talent Search Program- Ruthie King	3/16/2005
WISER	Council for the Advancement of Science Writing (CASW)	3/29/2005
WISER	Fayette High School - Aaron Ostrowski	4/1/2005
WISER	Japanese Anesthesiologist (TD to do tour)	4/5/2005
WISER	Anes faculty recruit Dr. Paul Bigeleisen	4/7/2005
WISER	Elizabeth Poster, Dean of SON, Univ. of Texas at Arlington - David Beatty/Laerdal	4/8/2005
WISER	Second Look 2005	4/9/2005

WISER	Human Physiology class tour - Laurel Roberts	4/11/2005
WISER	Gigi Duker,Assistant Prof Cell Biology & Physiology - Mclvor	4/12/2005
WISER	East Liverpool High School - Health Career Students	4/13/2005
WISER	3 attendies from Norway - Keving Parish	4/18/2005
WISER	Bentwood High School	4/27/2005
WISER	SON bring your kid to work day	4/28/2005
WISER	Allegheny Intermediate Gifted and Talented Students	5/5/2005
WISER	Tour for CEM Students and AED Demo TD	5/11/2005
WISER	Redbank High School Redbank	5/18/2005
WISER	Childrens Hospital Tour of WISER See IC TD	6/6/2005
WISER	John Mahoney and Curriculum Cmt. Tour	6/20/2005
WISER	MET Conference Tours of WISER See IC TD	6/25/2005
WISER	Lead Chaplain for pastoral care	6/30/2005

**All marked by an \* are Sim Medical related tours.**

**Peter M. Winter Institute for Simulation Education and Research (WISER)  
Faculty Retention Analysis**

**Retention of Difficult Airway Management Skills by Practicing Anesthesiologists**

R.Romeo MD, JJ Quinlan MD, D Metro MD, J Lutz BS, and J Schaefer MD  
University of Pittsburgh Department of Anesthesiology

**Introduction:** Management of the difficult airway is an area of anesthetic practice with tremendous potential for patient morbidity and mortality. We developed a competency-based Difficult Airway Management (DAM) training course using human dynamic simulation.<sup>1</sup> Many of the faculty in our department were put through this training course 1-3 years ago. Only 24% of faculty were competent prior to the course, but all were judged competent after the completion of the course.<sup>1</sup> The long-term retention of these DAM skills has not been measured. We hypothesized that this improvement in DAM skills would be retained over a subsequent 1-3 year period.

**Methods:** Faculty who had been tested 1-3 years ago were re-tested with four difficult airway scenarios that incorporate each arm of the difficult airway algorithm: 1) can't intubate-can't ventilate, supraglottic or subglottic techniques work, 2) can't intubate-can't ventilate, only subglottic techniques work, 3) can't intubate-can ventilate, and 4) abnormal airway anatomy which should be approached with an awake technique. The tools available for airway management were: Mac/Miller blades, LMA/Fastrach LMA, Combitube, trans-tracheal jet ventilation, cricothyrotomy kit, lighted stylet, retrograde intubation kit, gum bougie, ET tube exchangers, and various oral/nasal airways. Participants completed the scenarios and were rated as competent or not based on these criteria: 1) following the ASA difficult airway algorithm – including calling for help, 2) proper use of tools within the algorithm, 3) ventilation of a “can't ventilate” patient within five minutes, and 4) airway definitively secured in a “can ventilate” patient within ten minutes. If these criteria were not met, the faculty failed the scenario even if the patient survived. The faculty had to pass all four scenarios in order to be rated as competent.

**Results:** We re-tested 22 faculty. 6 of the 22 (27%) failed at least one difficult airway scenario while 16 of the 22 (73%) passed all four scenarios.

**Discussion:** There does not appear to be any data in the literature on the maintenance of competency in simulated difficult airway management (DAM) skills. However, there is some data on maintenance of competency in advanced cardiac life support (ACLS) skills.<sup>2</sup> In a study by Stross et al, one-hundred and thirty two physicians successfully completed ACLS. One year after testing, only 52% maintained competency when re-tested.<sup>2</sup> This may be considered a reasonable retention of ACLS skills since it is recommended that renewal should be every two years. Our data shows a 73% retention of DAM skills after 1-3 years. This suggests that the competency of DAM skills is higher than what is reported in the literature for retention of ACLS skills. The DAM training course using human dynamic simulation appears to do well in terms of retention of difficult airway management skills.

**References:**

1. Schaefer, J. Mandatory competency-based Difficult Airway Management Training at the University of Pittsburgh Department of Anesthesiology --- Preliminary Findings. *Anesthesia & Analgesia*. 2004, 98:5S.
2. Stross, JK. Maintaining competency in advanced cardiac life support skills. *JAMA*. 1983, Jun 24;249(24):3339-41.

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**Publications****Peer Review Articles**

- Grenvik A, Schaefer JJ, Devita MA, Rogers P: New Aspects on Critical Care Medicine Training. *Current Opinion in Critical Care* August 2004: 233-237.
- Rogers PL, Jacobs H, Rashwan A, Pinsky MR: [Quantifying learning in medical students during a critical care medicine elective: A comparison of three evaluation instruments](#). *Crit Care Med* 29:1268-73; 2001
- Schaefer JJ, Grenvik A: [Simulation-based Training at the University of Pittsburgh](#). *Annals Academy of Medicine* 30(3): p 274; May 2001
- Rogers PL, Jacobs H, Thomas E, Willenkin R: [Medical students can learn the basic application, analytic, evaluative, and psychomotor skills of Critical Care Medicine](#). *Crit Care Med* 29:1268-72; 2001
- Schaefer JJ, Gonzalez R: Dynamic Simulation: A New Tool for Difficult Airway Training of Professional Healthcare Providers. Invited article in the *American Journal of Clinical Anesthesiology* 27(3) pp 232-242; May 2000
- Powner D, Rogers PL: The process of educational change. *Crit Care Med* 27:2289-2290, 1999
- Murray M, Rogers P: Education in critical care medicine for medical students. *New Horizons* 6:244-246, 1998
- Rogers P: Developing a curriculum for medical students in critical care medicine. *New Horizons* 6:248-259, 1998
- Patel R, Crombleholme W: [Using Simulation to Train Residents in Critical Events](#). *Academic Medicine* 73:5; 1998
- Rogers PL, Grenvik A, Willenkin R: [Teaching medical students complex cognitive skills in the Intensive Care Unit](#). *Crit Care Med* 23:575-581, 1995

**Published Abstracts**

- Dongilli T, Mininni N, Stein K, DeVita M: [The BIG Shock – AED Trial for Non-Experienced Responders](#). *Anesthesia and Analgesia* (In Press)
- Dongilli T, Schaefer JJ, Roth RN, Cox RE, Garretson D, Rickens MJ, Sabol PA, Pelkofer JS, Pinchalk ME, Shrader AL: [Using Simulation Based Learning Systems to Train a Large Urban EMS Service in Difficult Airway Management](#). *Anesthesia and Analgesia* (In Press)
- Lutz J, Mitchell K, Schaefer JJ: [The use of a Simulation Information Management System \(SIMS\) for Data Mining of Simulation Sessions](#). *Anesthesia and Analgesia* (In Press)
- Mahoney J: Integration of Human Patient Simulation into a Comprehensive Standardized Patient OSCE. *Anesthesia and Analgesia* (In Press)
- Phrampus P, Dorfsman ML, Cole JS: [Death During Simulation Training: Feedback from Trainees](#). *Anesthesia and Analgesia* (In Press)
- Quinlan J, Schaefer JJ: [Functional Validity of Airway Techniques in Whole Task Human Simulation](#). *Anesthesia and Analgesia* (In Press)
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**Peter M. Winter Institute for Simulation Education and Research (WISER) Abstracts**

**Functional Validity of Airway Techniques in Whole Task Human Simulation Using the Laerdal SimMan**

**Joseph J. Quinlan, MD** and John J. Schaefer, MD, Winter Institute for Simulation Education and Research and Department of Anesthesiology, University of Pittsburgh

**Introduction:** Whole task human simulation holds great promise as a evaluation and training tool in areas such as difficult airway management. However, one of the prerequisites for proving whole task simulation to be a reliable educational instrument in difficult airway management is to demonstrate that airway techniques are performed in a functionally valid way, i.e., tools and techniques function within the simulator environment in the same way that they do in actual human patients. We hypothesized that the airway techniques suggested for use by the American Society of Anesthesiologists Difficult Airway Algorithm would be evaluated to be functionally valid in the Laerdal SimMan.

**Methods:** We invited 17 physicians experienced in difficult airway management to use a variety of techniques approved for use in the American Society of Anesthesiologists Difficult Airway Algorithm in the Laerdal SimMan and to rate the functional validity of those techniques compared with performing them in human patients. Participants were offered the opportunity to rate the validity of the lighted stylet, fiberoptic bronchoscope, Combitube, Laryngeal Mask Airway, the Fast Trach Intubating Laryngeal Mask Airway, Laryngeal Tube, intubating stylets (bougie), retrograde intubation, transtracheal jet ventilation, cricothyrotomy, and percutaneous cricothyrotomy. Participants were encouraged to rate only those techniques they felt comfortable performing in human patients in their daily practice. Participants rated individual techniques as valid or not valid. De-identified data was collected using a web-based application on a laptop computer in a fashion that blinded the authors to the decisions made by participants. Data was analyzed with the kappa statistic to determine if observed agreement was statistically different from chance. The null hypothesis (validity agreement was no greater than chance) was rejected for kappa values greater than 0.41.

**Results:** The results are summarized in Table 1. All techniques tested were rated valid. Agreement as to functional validity of most techniques was in the very good to excellent range. The exceptions were the lighted stylet and cricothyrotomy, where agreement as to validity was good and fair, respectively.

**Conclusions:** All airway techniques suggested within the ASA Difficult Airway Algorithm are functionally valid in the Laerdal SimMan.

**Table 1. Validity Ratings of Individual Techniques Used in the ASA Difficult Airway Algorithm**

Device	Raters	Valid	Not Valid	Kappa	Agreement
Lighted stylet	14	12	2	0.71	Good
Fiberoptic bronchoscope	17	16	1	0.88	Very Good
Combitube	16	15	1	0.88	Very Good
Laryngeal Mask Airway	17	16	1	0.88	Very Good
Fast Trach Laryngeal Mask Airway	16	16	0	1.0	Excellent
Laryngeal tube	15	14	1	0.87	Very Good
Intubating stylet/bougie	15	15	0	1.0	Excellent
Retrograde intubation	15	14	1	0.87	Very Good
Transtracheal jet ventilation	15	15	0	1.0	Excellent
Cricothyrotomy	14	11	3	0.57	Fair
Percutaneous cricothyrotomy	14	13	1	0.86	Very Good

## The BIG Shock – AED Trials for Non-Experienced Responders

Michael DeVita, MD, Associate Professor Critical Care

Thomas Dongilli Operations Director, WISER

Nicolette C. Mininni, RN, MEd, CCRN, Advanced Practice Nurse, Critical Care

Karen Stein RN, MEd, BSN, CCRN, Clinical Nurse Specialist

In the spring of 2004 University of Pittsburgh Medical Center (UPMC) Health System committed to placing AEDs at over 200 of its facilities including physician offices, business and corporate offices, physical therapy sites. The committee needed to decide which AED would best meet the needs of all sites. An expert panel was formed and established the desirable characteristics of the AED. They then needed to test whether the potential AEDs met the desirable characteristics.

Methods.

Setting: UPMC, Peter M. Winter Institute for Simulation Education and Research (WISER), Medical Education Theaters. Each theater contained one full scale simulator, Laerdal SimMan, a bed, full scale audio and video capabilities.

Participants: Fourteen untrained volunteer lay people who had never used an AED evaluated 2 of 6 AEDs selected by the committee.

Procedure: Facilitators informed each participant that we would be evaluating the ease of use of randomly chosen AED's, recording their performance data, and then questioning each subject about the functionality of the devices. Each participant was informed about the simulation setting. Finally, participants were told the victim was unconscious and needed the AED. They were then given the AED. At this time, the timed observation began. Primary endpoint was time to defibrillation. Secondary endpoint was user satisfaction. Trained observers (3) utilized a 9- point AED Trial Evaluation Tool (ATET) constructed by the evaluation committee to record participant performance.

## **Using Simulation Based Learning Systems to Train a Large Urban EMS Services in Difficult Airway Management**

Thomas A. Dongilli WISER

Myron Rickens

Roy Cox

Paul Sabol

Mark Pinchalk

**Introduction:** The use of simulation based learning systems to assess and evaluate Paramedics is novel. Using a combination of on line curriculum, the City of Pittsburgh EMS Difficult Airway Algorithm, and simulation based workshops, we were able to train and evaluate 174 City of Pittsburgh paramedics in management of difficult airways. The goal was to assess the comfort level and working knowledge of the paramedic using City of Pittsburgh Paramedic Difficult airway Management Algorithm. This was done by comparing pre and post course surveys.

### **Methods:**

All of the training took place at The Peter M. Winter Institute for Simulation Education and Research (WISER). The training course included approximately three hours of self paced on line difficult airway management curriculum and approximately 3.5 hours of simulation based training exercises and scenarios. The workshop component included review of the City of Pittsburgh Difficult Airway Algorithm, review of difficult airway techniques and devices. Paramedic trainers guided by on line curriculum allowed for greater uniformity of the program. Assessment of the paramedic's performance was enhanced through a pre and post survey utilizing a web-based program that was completed by each trainee.

**Results:** Trained 174 City of Pittsburgh Paramedics in difficult airway management. Each medic received four scenarios. 696 scenarios in total were run. Pre-course and post- course surveys were completed on line. All except one paramedic completed both surveys. A 21% improvement in knowledge of the Difficult Airway Algorithm was reported by the paramedics, Additionally 11% of the paramedics reported their knowledge of the Difficult Airway Algorithm was such that they could apply it clinically without having to think about it. A 99 % completion rate of surveys enhanced this research; all except one paramedic completed both surveys.

**Conclusion:** Using a combination of pre and post course surveys and simulation based training exercises, we were able to evaluate performances and attitudes of paramedics based on knowledge and technical skills in difficult airway management. This model was well received and demonstrated improvement in the paramedics Difficult Airway Management Algorithm knowledge. The future analysis of scenario data and clinical experience will be reviewed.

The use of a Simulation Information Management System (SIMS) for data mining of simulation sessions.

**John Lutz**, Kimberly Mitchell, John Schaefer III M.D.

The Peter M. Winter Institute for Simulation, Education and Research (WISER)

**Setting:** The Peter M. Winter Institute for Simulation, Education and Research (WISER) is a large academic simulation center based at the University of Pittsburgh. WISER has developed a web based Simulation Information Management System (SIMS) that allows customized surveys, evaluations and quizzes to be completed online by course participants and collect data from the simulation sessions. Each completed form is stored with a unique ID of that user. WISER uses the Laerdal SimMan patient simulator which creates an automated log file of the simulation session. The software that controls the simulator allows for automated data capture, such as when ventilation is detected, as well as a customizable interface that allows end users to record events that happen by simply selecting an item off of a menu, such as when a participant uses a specific airway device. This log file is stored in a standardized Extensible Markup Language (XML) format. Using the SIMS, the session log file can be uploaded into the database and linked to the particular participant for that session.

**Method:** WISER, as part of its SIMS, has developed a Medical Simulation Educational Analysis Tool (MSEAT) to allow the online linking of these online forms to the XML data. Users can select a particular question from a form and then select the criteria collected in the XML data logs from the session. The SIMS will then display the results of the query in both a graphical and tabular format. Links to each session log allow the user to drill down into specific data files to get further information on that session. Different Extensible Style Sheets (XSL) can be applied to the session XML data to provide different views of the data. Digital video recordings of the sessions can be hyperlinked to time specific points in the data so that that a video review of the session can be conducted. As an example, a question on a pre-course survey regarding years of experience can be linked to how often a specific device is used for a certain scenario.

**Results:** Using this new tool, researchers at WISER are able to easily collect data regarding the simulation sessions recorded there. This data is collected as part of the normal teaching process. This process, when coupled with standardized scenarios, offer some significant opportunities:

- Practical collection of real time objective data from simulation encounters
- Real-time standardized performance analysis to support feedback, educational research and quality assurance
- Practical relational data mining that can be coupled with demographic information and survey information (also collected as part of the process) and the opportunity for practical, inter-institutional collaborative data collection for educational research

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