

DATE: 10-26-18

CURRICULUM VITAE

Name: Marilyn Hravnak, RN, PhD, ACNP-BC, FAAN, FCCM

Business Address:

University of Pittsburgh School of Nursing
336 Victoria Building
3500 Victoria St.
Pittsburgh, PA 15261

E-mail:

mhra@pitt.edu

Cell Phone:

724-288-4134

Business Telephone:

(412) 624-3796

Business Fax:

(412) 383-7227

EDUCATION AND TRAINING

Undergraduate

1974	Indiana University of Pennsylvania Indiana, PA	BSN Nursing
------	---	----------------

Graduate

1983	University of Pittsburgh School of Nursing Pittsburgh, PA	MSN Pulmonary Clinical Nurse Specialist
1993	University of Pittsburgh School of Nursing Pittsburgh, PA	CRNP Acute Care Nurse Practitioner
2000	University of Pittsburgh School of Nursing Pittsburgh, PA	PhD Nursing

Post-Graduate

1983	University of Chicago Hospital and Clinics Chicago, IL	Certificate Registered Respiratory Therapist (RRT)
------	--	---

APPOINTMENTS AND POSITIONS

Academic

2016 to present	University of Pittsburgh School of Nursing Pittsburgh, PA	Director, PhD Program
-----------------	---	-----------------------

2016 to present	University of Pittsburgh School of Nursing Pittsburgh, PA	Professor with Tenure
2015-2016	University of Pittsburgh School of Nursing Pittsburgh, PA	Professor, Tenure stream Acute Care Nurse Practitioner Program Acute/ Tertiary Care Dept
2009-2013	University of Pittsburgh School of Nursing Pittsburgh, PA	Coordinator, Adult Med-Surg CNS DNP Program
2010-2015	University of Pittsburgh School of Nursing Pittsburgh, PA	Professor, Non-tenure stream Acute Care Nurse Practitioner Program Manager, Critical Care Clinical Emphasis Acute/ Tertiary Care Dept
2005-2010	University of Pittsburgh School of Nursing Pittsburgh, PA	Associate Professor, Non-tenure stream Acute Care Nurse Practitioner Program Manager, Critical Care Clinical Emphasis Acute/ Tertiary Care Dept,
2000-2005	University of Pittsburgh School of Nursing Pittsburgh, PA	Assistant Professor, Non-tenure stream Program Coordinator ('00-'03) Acute Care Nurse Practitioner Program Manager, Critical Care Clinical Emphasis Acute Care Nurse Practitioner Program Acute/Tertiary Care Department
1994 to 2000	University of Pittsburgh School of Nursing Pittsburgh, PA	Instructor. Non-tenure stream Acute Care Nurse Practitioner Program Manager, Critical Care Clinical Emphasis Acute Care Nurse Practitioner Program Acute/Tertiary Care Department
1994-1997	University of Pittsburgh School of Nursing Pittsburgh, PA	Program Director Acute Care Nurse Practitioner Program Manager, Critical Care Subspecialty Acute Care Nurse Practitioner Program Acute/Tertiary Care Department
1991-1994	University of Pittsburgh School of Nursing Pittsburgh, PA	Instructor, Non-tenure stream Graduate Program in Medical-Surgical Nursing
1990-1991	University of Pittsburgh School of Nursing Pittsburgh, PA	Adjunct Instructor, Graduate Program in Medical-Surgical Nursing
1983	Community College of Allegheny Co. North Side Campus	Interim Instructor Paramedical Program

Non-Academic

1994-Present	University of Pittsburgh Medical Center, Presbyterian Pittsburgh, PA	Acute Care Nurse Practitioner Clinical Privileges for Cardiothoracic Intensive Care Unit, Surgical ICU and Neurovascular ICU
1985-1991	Presbyterian-University Hospital Pittsburgh, PA	Head Nurse Surgical Intensive Care Unit Co-Leader, Critical Care Information System
1979-1985	Presbyterian-University Hospital Pittsburgh, PA	Clinical Instructor
1974	Presbyterian-University Hospital Pittsburgh, PA	Staff Nurse I

LICENSURE AND CERTIFICATION

1996 Recertified 2001, 2005, 2010, 2015	Acute Care Nurse Practitioner American Nurses Credentialing Center	ACNP-BC # 0256627-28
1993-present	Certified Registered Nurse Practitioner Pennsylvania	TP-002290-M
2011-present 2011-present	CRNP Prescriptive Authority DEA Prescriber	#017743
2010, 2014	Adult Critical Care Clinical Nurse Specialist American Assoc. Critical Care Nurses	CCNS CCNS 0047384
1974-present	Registered Nurse	RN-198543-L Pennsylvania
1983	Registered Respiratory Therapist	21658 Pennsylvania
1980 Recertified 1983, 1986 1989, 1992, 1995, 1998, 2001, 2005	Certified Critical Care Nurse (CCRN) American Association of Critical Care Nurses	#0010408
1983	Certified Respiratory Care Technician (CRTT) National Board for Respiratory Care	
1985	Registered Respiratory Therapist (RRT) National Board for Respiratory Care	#21658

MEMBERSHIP IN PROFESSIONAL AND SCIENTIFIC SOCIETIES

Memberships, Elected Offices, Committees Chaired

1975-Present	Member, American Association of Critical-Care Nurses (AACN) #0047384
1999-2001	Member, (appointed) Advanced Practice Nursing Workgroup, (Significant Contributor to the “Scope of Practice and Standards of Care for Acute and Critical Care Clinical Nurse Specialists”)
2004-2005	Member (appointed) Advanced Practice Nursing Workgroup
2005-2006	Member (appointed) Research Work Group
2004-2006	Member (appointed) Task Force for Revision of ACNP Scope of Practice and Standards of Clinical and Professional Performance
2011-2012	Member (appointed) Task Force for Revision of ACNP Scope of Practice and Standards of Clinical and Professional Performance
2011, 2012, 2014	Appointment AACN Ambassador
1984-1992	Member, Pennsylvania Society for Respiratory Care
1984-1992	Member, Planning Committee
1989-Present	Member, Three Rivers Chapter, AACN
1983-Present	Member, Eta Chapter, Sigma Theta Tau, National Nursing Honors Sorority
1995-1997	Graduate Counselor (elected Position)
1994-Present	Member, Pennsylvania Nurses Association #0406496
1994-Present	Member, National Organization of Nurse Practitioner Faculty
1998-2001	Member, (appointed) Task Force On NP Program Certification Implementation
1999-2002	Member, (appointed) Task Force on Organizational Structure
2000-2004	Co-Chair, Acute Care NP Special Interest Group
2004-2005	Co-Chair, National Panel, ACNP Specialty Competencies
2000-2004	Co-Chair, Acute Care NP Special Interest Group
2005-2006	Chair, Acute Care NP Special Interest Group
2006-2007	Member, Task Force on Doctor of Nursing Practice NP Competencies and Indicators
2007-2008	Member, Advisory Group, NONPF Study on NP Specialty Track Delineation

	2011-2012	Member, National Panel (convened by NONPF and American Academy of Colleges of Nursing) Adult Gerontology Acute Care Nurse Practitioner Competencies
1994-Present		Member, Society of Critical Care Medicine #016067
	1997-1999	Member, Advanced Practice Nursing Committee
	1998-2000	Member, (appointed) Task Force on “Guidelines for Physician Extenders in the ICU”
	2003-2004	Chair, Nursing Section Research Committee
	2003-2011	Member, Normal J. Shoemaker Research Grant Selection Committee
	2004-2005	Chair, Nursing Section Research Committee
	2006-2008	Member, (appointed), Graduate and Resident Education Committee
	2008-2010	Member, (appointed), Research Committee (society-wide)
	2008-2010	Chair Elect, Nursing Section
	2010-2012	Chair, Nursing Section
	2012-2014	Past-Chair, Nursing Section
	2011-2012	Vice-Chair, Research Committee (society-wide)
	2012-2013	Chair, Research Committee
	2013-2014	Past Chair, Research Committee
	2013-2014	Acting Chair, Research Section
	2014-2015	Co-Chair; NP/PA eLearning Task Force; Immediate Past Chair
	2014-2016	2016-2017 Chair, Research Section Committee on Clinical and Epidemiologic Research
	2013-2016	Member, Scientific Congress Planning Committee
	2016-2019	Member, Strategic Planning Committee
	2015-2018	Member, TeleICU Committee
	2018-2020	Chair Elect, Chair, Past-Chair TeleICU Committee
	2017-2020	Member (elected) Discovery Steering Committee (Discovery is the Critical Care Research Network fo the Society of Critical Care Medicine)

	2019-2020	Member (elected) Discovery Oversight Committee
1994-present	Member, American Nurses Association	#00406496
	1994-1997	Member, American Nurses Credentialing Center of ANA Board on Certification Acute Care Nurse Practitioner Credential Examination
	1995-1997	Member, Test Development Committee, National Certification Examination for Acute Care Nurse Practitioners, American Nurses Credentialing Center of ANA & AACN
	1997-1998	Member, Nurse Practitioner Role Delineation Study, American Nurses Credentialing Center of ANA
	2016-2017	Appointee to National Quality Forum, Diagnostic Accuracy Committee
2016-present	Member, Eastern Nursing Research Society (ENRS)	
2016-present	Member International Network for Doctoral Nursing Education (INDEN)	
	2018-2021	Board—Elected Member-At-Large position

National Conference Planning Committee

1997-1998	Chair, National Planning Committee, 6 th Annual Acute Care Nurse Practitioner Conference
20013-2016	Member, Scientific Congress Planning Committee, Society of Critical Care Medicine

HONORS AND AWARDS

1983	Sigma Theta Tau, Nursing Honor Society
1989	Who's Who in American Nursing
1993-1994	Wyeth-Ayerst Clinical Fellowship Program. Applied for fellowship, acted as mentor for a nurse in advanced critical care practice from June, 1993 to June, 1994. Nurse selected to be fellow: Lynn Kelso CRNP, Acute Care Nurse Practitioner, Liver Transplant ICU, UPMC
1994	Finalist, Educator Category, Nightingale Awards of Pennsylvania
1996	Ruth Perkins Kuehn Award Achievement as a Doctoral Student Eta Chapter, Sigma Theta Tau
1999	Inducted as Fellow in the American College of Critical Care Medicine, Society of Critical Care Medicine (FCCM)
2001	Selected through competitive application to participate in “Research Training:

- Developing Nurse Scientists” July 17-20 in Bethesda, MD by the National Institutes of Nursing Research
- 2004 Society of Critical Care Medicine 33rd Critical Care Congress. Orlando, FL. Winner of the **Nursing Specialty Award** for highest abstract score. *Standard versus off pump primary isolated CABG: comparison of complications in a matched sample.*
- 2006 **Dean's Distinguished Teaching Award, School of Nursing, University of Pittsburgh**
- 2006 Inducted as **Fellow in the American Academy of Nursing (FAAN)**
- 2006 American Association of Critical Care Nurses National Teaching Institute, Anaheim CA. Winner of an **AACN Research Abstract Award 2006** for **Hravnak, M.**, Crago, E., Kong, Y., Horowitz, M.B. *Prevalence of electrocardiographic abnormalities in patients with subarachnoid hemorrhage.*
- 2007 **Chancellor's Distinguished Teaching Award University of Pittsburgh**
- 2007 American Association of Critical Care Nurses National Teaching Institute, Anaheim CA. Winner of an **AACN Research Abstract Award 2007** for **Hravnak, M.**, Crago, E., Hricik, A, Horowitz, M.B. *Prevalence of electrocardiographic abnormalities in patients with subarachnoid hemorrhage.*
- 2007 3rd International Conference for Medical Emergency Treatment/Rapid Response Systems Conference. Pittsburgh, PA. Winner of **Research Abstract Award 2007** for **Hravnak, M**, Edwards, L., Clontz, A., Foster-Heasley, M., DeVita, M., Pinsky, M. *Electronic Integrated Monitoring of Medical Emergency Team Calls to a Step Down Unit. (Phase 1)*
- 2007 Visiting Professor, University of Basel, Switzerland.
- 2008 Society of Critical Care Medicine, **Normal J. Shoemaker Critical Care Nursing Excellence Award**. Presented in recognition of an active SCCM nursing section member who demonstrates superiority in critical care nursing practice, education, and/or administration.
- 2008 4th International Conference for Medical Emergency Treatment/Rapid Response Systems Conference. Toronto, ON, Winner of *Research Abstract Award 2008* for **Hravnak, M**, Edwards, L., Clontz, A., M., DeVita, M., Pinsky, M. *Impact of an Electronic Integrated Monitoring System Upon the Incidence and Duration of Patient Instability on a Step Down Unit (Phase 3)*
- 2008 **Bayada Award for Technological Innovation in Nursing education and Practice**. Presented by Drexel University's College of Nursing and Health Professions. The goal of this award is to reward and recognize the lasting and vital contributions of nurses through their use of technology

- 2008 **UPMC Presbyterian Quality and Innovation Fair 2008. First Place Award Winner in the Patient Safety Category** for **Hravnak M**, Edwards L, Clontz A, Valenta C, Samuels M, C Lorenz H, Schmid A, Radakovich K, DeVita MA, Pinsky MR. *Impact of the BioSign™ Electronic Integrated Monitoring System (IMS) on the Incidence and Duration of Patient Instability on a Step-Down Unit.*
- 2008 Visiting Professor, University of Kentucky
Rapid Response Systems and Instability Detection
- 2008 Newspaper article in Pittsburgh Post-Gazette 3/3/2008
<http://www.post-gazette.com/local/2008/03/03/The-Thinkers-Technology-helps-patients-recover-after-intensive-care/stories/200803030207>
- 2008 Newspaper article in Pittsburgh Post-Gazette 7/2/2008.
<http://www.post-gazette.com/news/health/2008/07/02/Nursing-educator-honored-for-early-warning-system-for-patients/stories/200807020244>
- 2009 **Society of Critical Care Medicine. 2009 Annual Scientific Award (top 10 scoring abstracts)**
Hravnak M, Frangiskakis JM, Crago E, Chang Y, Gorcsan J, Horowitz MB. Relationship Between Left Ventricular Wall Motion Abnormalities and Markers of Neurocardiac Injury in Patients with Aneurysmal Subarachnoid Hemorrhage.
- 2009 **Society of Critical Care Medicine. My predoctoral student PeiYing Chuang won the Young Investigator Award 2009 for:** Neuroglobin Genetic Polymorphisms and Their relationship to Functional Outcomes Following Traumatic brain Injury
- 2009 **Society of Critical Care Medicine. Presidential Citation.** In recognition of outstanding contributions to the Society.
- 2010 **Society of Critical Care Medicine. Presidential Citation.** In recognition of outstanding contributions to the Society.
- 2010 **AACN Ambassador**
- 2012 **Society of Critical Care Medicine. Presidential Citation.** In recognition of outstanding contributions to the Society.
- 2012 **Society of Critical Care Medicine. 2102 Neurology Specialty Award. Hravnak M**, Thampatty B, Poloyac S, Yao J, Crago E, Horowitz M. Monoamine Relationship to Blood Load Following Aneurysmal Subarachnoid Hemorrhage.
- 2012 **Visiting Professor, Fudan University, Shanghai China.** Invited to develop and implement a 3-week intensive course for the first post-BSN Critical Care Nurse Clinical Specialist program in China.

- 2012 **Society of Critical Care Medicine. 2103 Neurology Specialty Award Hravnak M,** Chang Y; Price TJ; Crago E. Horowitz M. Impact of Myocardial Injury after Subarachnoid Hemorrhage (SAHMI) Upon Perfusion. *Critical Care Medicine*, 2012
- 2013 **Society of Critical Care Medicine. Presidential Citation.** In recognition of outstanding contributions to the Society.
- 2014 **International Society of Rapid Response Systems. Research Citation.** Bose E, Chen L, Pinsky MR, Hravnak M. Diurnal variation in vital sign alerts according to Medical Emergency Team (MET) trigger criteria in continuously monitored step-down unit (SDU) patients.
- 2014 **Visiting Professor, Fudan University, Shanghai China.** Invited to repeat our 3-week intensive course for the first post-BSN Critical Care Nurse Clinical Specialist program in China. Second student cohort.
- 2014 **Keynote Address.** 2014 Shanghai International Nursing Conference, Critical Care Track. “Quality Indicators for ICU Nursing”. 9/27/14 Shanghai, China
2014. **Keynote Address.** “Performing Research That Saves Lives: A Necessity, a Right, and a Privilege for Nurses”. 10/31/14 Nursing Consortium of South Florida Inc. Generating Evidence for Education and Clinical Practice Conference
- 2015 **Society of Critical Care Medicine. 2015 Annual Scientific Award. Top 10 scoring abstracts.** *Hravnak M,* Chen L, Dubrawski A, Wang D, Bose E, Clermont G, Pinsky MR. Random Forest Models Separate Vital Sign Events as Real or Artifact in Continuous Monitoring Data. *Critical Care Medicine*. 2014
- 2015 **Mitchell P. Fink Scholarship Day; Clinical Research Award. Department of Critical Care Medicine, University of Pittsburgh.** Random Forest machine learning models separate vital sign events as real or artifact in continuous monitoring data.
- 2016 **Nightingale Awards of Pennsylvania, WINNER Nursing Research Category**
- 2017 **Society of Critical Care Medicine. STAR Research Award. Hravnak M,** Chen L, Dubrawski A, Clermont G, Pinsky MR. Machine learning can pre-identify patients at risk for cardiorespiratory instability before a medical emergency team call.
- 2017 **Society of Critical Care Medicine. STAR Research Award.** Yousef K, Crago E, Chang Y, Lagattuta T, *Hravnak M.* Vasopressor use in subarachnoid hemorrhage: Does it improve cerebral oxygenation?
- 2018 **Society of Critical Care Medicine. STAR Research Award.** Wertz A, Hravnak M, Dubrawski A, Chen L, Pellathy T, Clermont G, Pinsky MR. Sampling Frequency For Machine Learning to Separate Monitoring Artifact from Instability.

- 2018 **Society of Critical Care Medicine. STAR Research Award.** Hravnak M, Yousef KM, Kagiya N, Sugahara M, Crago E, Mahmoud K, Lagattuta T, Gorcsan Persistent Global Longitudinal Strain Abnormality By Echocardiogram Predicted by Cardiac Troponin I. *Critical Care Medicine*. 2017

PUBLICATIONS

Refereed Articles * = data-based

1. **Hravnak M**, George E. Nursing considerations for the patient with a total artificial heart. *Critical Care Nursing Clinics of North America*. 1993; 1: 495-513.
2. **Hravnak M**. Spotlight Article: Effect of backrest position on mixed venous oxygen saturation in patients with mechanical ventilation after coronary artery bypass surgery. *Heart & Lung*, 1992; 21(6): 578-82.
3. **Hravnak M**, Stein KL, Dale B, Hazy JC. Ongoing development of the critical Care information system: the collaborative approach to automating information management in an intensive care unit. *Proc Annu Symp Comput Appl Med Care*. 1992: 3-7. PMC: 2248134.
4. **Hravnak M**, George E, Kormos,R. Management of chronic percutaneous left ventricular assist device percutaneous lead insertion sites. *The Journal of Heart and Lung Transplantation*. 1993; 12: 856-63.
5. Kelso LA, **Hravnak M**. Delicate distinctions: Infection or rejection? *AJN Supplement*. 1994; 94: 15-19.
6. Snyder JV, Sirio CA, Angus DC. **Hravnak M**, Kobert SN, Sinz EH, Rudy EB. Trial of nurse practitioners in intensive care. *New Horizons*. 1994; 2(3): 1-9.
7. **Hravnak M**, Kobert S, Risco K, Baldisseri M, Hoffman LA, Clochesy JM, Ruby EB, Snyder JV. Acute care nurse practitioner program: Content and development process. *American Journal of Critical Care*. 1995; 4(3): 179-88.
8. **Hravnak M**, Rosenzweig MQ, Baldisseri M. Current questions with regard to acute care nurse practitioner preparation and role implementation. *AACN Clinical Issues*. 1996; 7(2): 289-299.
9. **Hravnak M**, Magdic K. Marketing the acute care nurse practitioner. *Clinical Excellence for Nurse Practitioners*. 1996; 1(1): 9-13.
10. Lyness AL, **Hravnak M**, Martich D. Nurses' perceptions of the impact of a computerized information system on a critical care unit. *Studies in Health Technology & Informatics*, 1997; 46: 463-468.
11. **Hravnak M**, Baldisseri M. Credentialing and privileging: Insight into the process for acute care nurse practitioners. *AACN Clinical Issues*. 1997; 8(1): 108-115.
12. **Hravnak M**, Boujoukos A. Hypotension. *AACN Clinical Issues*. 1997; 8(3): 303-318.

13. Rosenzweig M, **Hravnak M**, Jacob H. One school's experience with the development of an oncology nurse practitioner curriculum. *Oncology Nursing Forum*. 1997; 24(5): 845-851.
14. **Hravnak M**. Is there a health promotion and protection foundation to the practice of acute care nurse practitioners? *AACN Clinical Issues*. 1998; 9(2): 283-298.
15. *Rudy EB, Davidson LJ, Daly BJ, Clochesy JM, Sereika S, Baldisseri M, **Hravnak M**, Ross T, Ryan C. Care activities and outcomes of patients cared for by acute care nurse practitioners, physician assistants: A comparison. *American Journal of Critical Care*. 1998; 7(4): 267-281.
16. Konscol K, Devoogd K, **Hravnak M**, Zenati M. Minimally invasive coronary artery bypass grafting: A kinder cut. *Dimensions of Critical Care Nursing*. 1999; 18(2): 21-23.
17. ***Hravnak M**, Hoffman LA, Saul MI, Zullo TG, Cuneo JF, Whitman GR, Clochesy JM, Griffith BP. Atrial fibrillation: Prevalence after minimally invasive direct and standard coronary artery bypass. *Annals of Thoracic Surgery*. 2001; 71: 1491-5.
18. ***Hravnak M**, Hoffman LA, Saul MI, Zullo TG, Whitman GR, Griffith BP. Predictors and impact of atrial fibrillation after isolated coronary artery bypass grafting. *Critical Care Medicine*, 2002; 30(2), 330-337. PMC 3674411
19. ***Hravnak M**, Hoffman LA, Saul MI, Zullo TG, Whitman G. Resource utilization related to atrial fibrillation following coronary artery bypass grafting. *American Journal of Critical Care*. 2002; 11(3): 228-238.
20. **Hravnak M**. Who should do outcomes research on advanced practice nurses? *Critical Care Nursing Clinics of North America*. 2002; 14: 245-51.
21. ***Hravnak M**, Hoffman LA, Saul MI, Zullo T, Cuneo JF, Pellegrini RV. Short-term complications and resource utilization in matched subjects after primary isolated on-pump or off-pump coronary artery bypass. *American Journal of Critical Care*. 2004; 13(6): 499-508. PMC: 3655795. **Selected as Journal Club Feature Article for this Volume PMV 3655795**
22. Magdic K, **Hravnak M**. Credentialing for nurse practitioners: An update. *AACN Clinical Issues in Critical Care Nursing*. 2005; 16: 16-22.
23. Kleinpell R, **Hravnak M**. Strategies for Success in the Acute Care Nurse Practitioner Role. *Critical Care Nursing Clinics of North America*. 2005; 17(2): 177-81.
24. **Hravnak M**, Tuite P, Baldisseri M. Expanding acute care nurse practitioner and clinical nurse specialist education: invasive procedure training and human simulation in critical care. *AACN Clinical Issues*. 2005; 16(1): 89-100.
25. *Kleinpell R, **Hravnak M**, Werner KE, Guzman A. Skills taught in acute care nurse practitioner programs: Results from a national survey. *Nurse Practitioner*, 2006; 31(2): 7-13.
26. **Hravnak M**, Beach M, Tuite P. Simulator technology as a tool for education in cardiac care. *Journal of Cardiovascular Nursing*. 2007; 22: 16-24.

27. **Hravnak M.** Ibrahim S, Kaufer A, Sonel A, Conigliaro J. Racial disparities in outcomes following coronary artery bypass grafting. *Journal of Cardiovascular Nursing*. 2006; 21(5): 367-78. PMC: 3660098. PMC 3660098
28. ***Hravnak M**, Whittle J, Kelley ME, Sereika S, Good CB, Ibrahim S, Conigliaro J. (2007). Symptom expression in coronary heart disease and revascularization recommendations for black and white patients. *American Journal of Public Health*, 97, 1701-1708. PMC: 1963307.
29. Melander, S., Kleinpell, R., **Hravnak, M.**, King, J., Miller, K. Post-masters certification programs for nurse practitioners: Population specialty role preparation. *Journal of the American Academy of Nurse Practitioners*. 2008; 20: 63-68.
30. ***Hravnak M**, Edwards L, Clontz A, Valenta C, DeVita M, Pinsky M. Defining the incidence of cardio-respiratory instability in step-down unit patients using an electronic integrated monitoring system. *Archives of Internal Medicine*. 2008; 68(12): 1300-1308.
31. * Tanabe, M., Crago, E., Suffoletto, M., **Hravnak, M.**, Kassam, A., Horowitz, M., Gorcsan, J. Relation of elevation in cardiac troponin-I to clinical severity, cardiac dysfunction and pulmonary congestion in patients with aneurysmal subarachnoid hemorrhage. *American Journal of Cardiology*. 2008; 102: 1545-50.
32. Kleinpell R, **Hravnak M**, Hinch B, Llewellyn J. Developing and advanced practice nursing credentialing model for acute care facilities. *Nursing Administration Quarterly*. 2008; 32: 279-287.
33. Rosenzweig M, **Hravnak M**, Magdic K, Beach M, Clifton M, Arnold R. Patient communication simulation laboratory for students in an acute care nurse practitioner program. *American Journal of Critical Care*. 2008; 17:364-72.
34. **Hravnak M**. Credentialing for Advanced practice Nurses. *AACN Advanced Critical Care*. 2009; 20(1): 12-14.
35. *Turk M, Yang K, **Hravnak M**, Sereika S, Ewing LJ, Burke LE. Randomized clinical trials of weight loss maintenance: a review. *Journal of Cardiovascular Nursing*. 2009; 24: 58-80. PMC: 2676575.
36. * Frangiskakis JM, **Hravnak M**, Crago EA, Tanabe M, Kip KE, Gorcsan J, Horowitz MB, Kassam A, London B. Ventricular arrhythmia risk after subarachnoid hemorrhage. *Neurocritical Care*. 2009; 10(3): 287-94. PMC 3673292
37. Kleinpell R, Hravnak M, Settles J, Melander S. Making the Web work for acute care NP education. *Nurse Practitioner*. 2009; 34:8-10.
38. * **Hravnak M**, Frangiskakis JM, Crago EA, Chang Y, Tanabe M, Gorcsan J 3rd, Horowitz MB. Elevated cardiac troponin I and relationship to persistence of electrocardiographic and echocardiographic abnormalities after aneurysmal subarachnoid hemorrhage. *Stroke*. 2009; 40: 3478-3484. PMC 3680357

39. *Miketic, J, **Hravnak, M**, Sereika SM, Crago EA. Elevated Cardiac Troponin I and Functional Recovery and Disability in Patients after Subarachnoid Hemorrhage. *American Journal of Critical Care*. 2010; 19: 522-528. PMC: 3131787.
40. DeVita MA, Smith GB, Adam SK, Adams-Pizarro I, Buist M, Bellomo R, Bonello R, Cerchiari E, Farlow B, Goldsmith D, Haskell H, Hillman K, Howell M, **Hravnak M**, Hunt EA, Hvarfner A, Kellett J, Lighthall GK, Lippert A, Lippert FK, Mahroof R, Myers JS, Rosen M, Reynolds S, Rotondi A, Rubulotta F, Winters B. Identifying hospitalized patients in crisis: A consensus conference on the afferent limb of Rapid Response Systems. *Resuscitation*. 2010; 81: 375–382.
41. *Chuang P, Conley YP, Poloyac SM, Okonkwo DO, Ren D, Sherwood PR, **Hravnak M**, Alexander S. Neuroglobin Genetic Polymorphisms and Their Relationship to Functional Outcomes Following Traumatic Brain Injury. *Journal of Neurotrauma*. 2010; 27: 99-1006. PMC: 2943497.
42. *Shatzer M, Wolf GA, **Hravnak M**, Haugh A, Kititutu J, Hoffman RL. A curriculum designed to decrease barriers to scholarly writing by staff nurses. *Journal of Nursing Administration*. 2010; 9: 392-398.
43. *Yousef K, Crago E, Kuo CW, Horowitz M, **Hravnak M**. Predictors of delayed cerebral ischemia after subarachnoid hemorrhage: A cardiac focus. *Neurocritical Care*. 2010; 13: 366-372. PMC: 3131087.
44. ***Hravnak M**, DeVita MA, Clontz A, Edwards L, Valenta C, Pinsky MR. Cardiorespiratory Instability before and after implementing an integrated monitoring system. *Critical Care Medicine*. 2011; 39: 65-72. PMC 3673290
45. Miketic JK, **Hravnak M**, Stilley CS, Robertson RJ, Sereika SM. Factors Influencing the Outcomes of Patients With Both Coronary Artery Disease and Diabetes Enrolled in Standard Cardiac Rehabilitation Programs: A Literature Review. *Journal of Cardiovascular Nursing*. 2011; 26: 210-217.
46. *Tarassenko L, Clifton DA, Pinsky MR, **Hravnak M**, Woods JR, Watkinson PJ. Centile-based early warning scores derived from statistical distributions of vital signs. *Resuscitation*. 2011; 82:1013-1018. PMID: 21482011
47. *Ott, L.K, **Hravnak, M.**, Clark, S. & Amesur, N. Patients' Instability, Emergency Response, and Outcomes in the Radiology Department. *American Journal of Critical Care*. 2011; 20 :461-469. PMC 3667404
48. *Ott LK, Hoffman LA, **Hravnak M** . Intrahospital Transport to the Radiology Department: Risk for Adverse Events, Nursing Surveillance, Utilization of a MET and Practice Implications. *Journal of Radiology Nursing*. 2011. 30: 49-52. PMC3109511.
49. *Yousef, K. Pinsky, M.R., DeVita, M. A., Sereika, S., **Hravnak, M**. Characteristics of patients with cardiorespiratory instability in a step-down unit: Pilot study. *American Journal of Critical Care*. 2012; 1(5); 344-350. PMID 22941708.

50. *Ott L., Pinsky M., Hoffman L., Clarke S., Clark S., Ren D, **Hravnak, M.** Medical Emergency Team Calls in the Radiology Department: Patient Characteristics and Outcomes. *BMJ Quality & Safety*. 2012; 21: 509-508. PMID: 22389020 PMC: 3630458.
51. Erb JL, Hravnak M, Rittenberger JC. Therapeutic hypothermia after cardiac arrest. *American Journal of Nursing*. 2012; 112(7): 38-44; quiz 46,45. doi: 10.1097/01.NAJ.0000415959.85050.1a.
52. *Turk MW, Sereika SM, Yang K, Ewing LJ, **Hravnak M**, Burke LE. Psychosocial correlates of weight maintenance among black & white adults. *American Journal of Health Behavior*. 2012; 36(3): 395-407. doi: 10.5993/AJHB.36.3.10. PMC: 3454451.
53. *Guttendorf J, Boujoukos AJ, Ren D, Rosenzweig MQ, **Hravnak M**. Characteristics associated with discharge outcome in adult patients treated with extracorporeal membrane oxygenation (ECMO). *American Journal of Critical Care*. 2014 Sep;23(5):365-77. doi: 10.4037/ajcc2014115. PMID 25179031
54. *Crago E, Kerris K, Kuo CW, Sherwood P, **Hravnak M**, Crippen D, Horowitz M. Cardiac abnormalities after aneurysmal subarachnoid hemorrhage: Effects of β -blockers and angiotensin-converting enzyme inhibitors. *American Journal of Critical Care*. 2014; 23(1): 30-9. doi: 10.4037/ajcc2014326.
55. *Evatt M, Ren D, Tuite P, Reynolds C, **Hravnak M**. Development and implementation of an educational support process for electronic nursing admission assessment documentation. *MedSurg Nurse*, 2014; 23: 89-95.
56. Bose E, **Hravnak M**, Pinsky MR. The interface between monitoring and physiology at the bedside. *Critical Care Clinics*. 2015; 31(1): 1-24. doi: 10.1016/j.ccc.2014.08.001. PMID:25435476 PMC 4251708
57. *Ott L, Pinsky M, Hoffman L, Clarke S, Clark S, Ren D, **Hravnak, M.** Patients in the radiology department may be at increased risk of developing critical instability. *Journal of Radiology Nursing*. 2015. 34(1): 29-34. PMID 25821413
58. *Drahnak D, **Hravnak M**, Ren D, Haines A, Tuite P. Instruction of Evidence-based Guidelines and Scripting to Support Acute Care Nurses in Sepsis Recognition, Reporting, and Treatment. *MEDSURG Nurse*. 2016 (in press)

*Drahnak D, **Hravnak M**, Ren D, Haines A, Tuite P. Evidence-Based Guidelines and Scripting to Support Nurses in Sepsis Recognition, Reporting, and Treatment. *Critical Care Nurse*. 2015; 35(2):E29-E29
59. *Ozekcin L, Tuite P, Willner K, **Hravnak M**. Simulation education: Early identification of patient physiologic deterioration by acute care nurses. *Clinical Nurse Specialist*. 2015; 29: 166-173. doi: 10.1097/NUR.0000000000000123
60. ***Hravnak M**; Chen L, Fiterau M, Dubrawski A, Clermont G, Guillame-Bert M, Bose E, Pinsky MR. Temporal distribution of patient instability events in continuously monitored step-down unit patients: Implications for Rapid Response Systems. *Resuscitation*. 2015; 80: 99-105. **PMC 436221**

61. * Parrish WM, **Hravnak M**, Dudjak L, Guttendorf J. Impact of a Modified Early Warning System on Rapid Response and Cardiopulmonary Arrest Calls in Telemetry and Medical-Surgical Units. *MEDSURG Nursing*. 2017; 26(1):15–19.
62. Al-Zaiti SS, Crago EA, **Hravnak M**, Kozik TM, Pelter MM, Carey MD. ECG changes during neurologic injury. *American Journal of Critical Care*. 2015; 25(5): 453-454. PMID 26330440
63. Bose E, **Hravnak M**. Thromboelastography: A practice summary for nurse practitioners treating hemorrhage. *Journal of Nurse Practitioners*. 2015; 11(7): 702-709. **PMC4528385**
64. ***Hravnak M**, Chen L, Dubrawski A, Bose E, Clermont G, Pinsky MR. Real Alerts and Artifact Classification in Archived High-Frequency Multi-signal Vital Sign Monitoring Data—Implications for Mining Big Data. *Journal of Clinical Monitoring and Computing*. 2015; (DOI) 10.1007/s10877-015-9788-2. **PMC4821824**
65. * Chen L, Dubrawski AW, Clermont G, Hravnak M, Pinsky MR. Modelling risk of cardiorespiratory instability as a heterogeneous process. *AMIA Annual Symposia Proceedings*. 2015; Nov 5 eCollection: 1841-1850. PMID 2695833
65. Pinsky MR, Clermont G, **Hravnak M**. Predicting cardiorespiratory instability. *Critical Care*. 2016 Mar 16;20(1):70. doi: 10.1186/s13054-016-1223-7. Review. PMID 26984263
66. *Kahn JM, Le TQ, Barnato AE, **Hravnak M**, Kuza CC, Pike F, Angus DC. ICU telemedicine and critical care mortality: a national effectiveness study. *Medical Care*. 2016 Mar;54(3):319-25. doi: 10.1097/MLR.0000000000000485. PMID 26765148
67. Bose E, Hoffman L., **Hravnak M**. Monitoring cardiorespiratory instability: Current approaches and implications for nursing practice. *Intensive and Critical Care Nursing*. 2016 Feb 26. pii: S0964-3397(15)00112-3. doi: 10.1016/j.iccn.2015.11.005. [Epub ahead of print] **PMC4848117**
68. *Chen L, Dubrawski AW, Wang D, Fiterau M, Guillame-Bert M, Bose E, Kaynar AM, Wallace DJ, Guttendorf J, Clermont G, Pinsky MR, Hravnak M. Using supervised machine learning to classify real alerts and artifact in online multi-signal vital sign monitoring data. *Critical Care Medicine*. 2016; 44(7):e456-63. doi: 10.1097/CCM.0000000000001660. **PMC4911247**
69. *Guillame-Bert M, Dubrawski A, Hravnak M, Wang D, Clermont G, Pinsky M. Learning Temporal Rules to Forecast Instability in Continuously Monitored Patients. *Journal of the American Medical Informatics Association*. 2016. Jun 6. pii: ocw048. doi: 10.1093/jamia/ocw048. [Epub ahead of print] PMID: 27274020
70. *Bose, E., **Hravnak M.**, Sereika, S. Vector Autoregressive (VAR) Model and Granger Causality in Nursing Research: Example of Dynamic Changes Among Vital Signs Prior to Instability. *Nursing Research*. 2017. Jan/Feb;66(1):12-19. PMID:27977564
71. * Chen L, Olufunmilayo O, Clermont G, **Hravnak M**, Pinsky MR, Dubrawski AW. Dynamic and personalized risk forecast in step-down units: Implications for monitoring paradigms. *Annals of the American Thoracic Society*. 2017 Mar;14(3):384-391. doi: 10.1513/AnnalsATS.201611-905OC. PMID: 28033032

72. *Liang Z, Ren D, Choi J, Happ MB, Hravnak M, Hoffman LA. Music intervention during daily weaning trials-A 6 day prospective randomized crossover trial. *Complement Ther Med*. 2016 Dec;29:72-77. doi: 10.1016/j.ctim.2016.09.003. Epub 2016 Sep 15. PMID: 27912960
73. *Bose E, Chen L, Clermont G, Dubrawski A, Pinsky MR, Ren D, Hoffman LA, **Hravnak M**. Risk for Cardiorespiratory Instability Following Transfer to a Monitored Step-Down Unit. *Respir Care*. 2017 Apr;62(4):415-422. doi: 10.4187/respcare.05001. Epub 2017 Jan 24. PMID: 28119497
74. *McAteer A, **Hravnak M**, Chang Y, Crago E, Gallek MJ, Yousef KM. The relationships between BNP and neurocardiac injury severity, noninvasive cardiac output, and outcomes after Aneurysmal subarachnoid hemorrhage. *Biol Res Nurs*. 2017 Oct;19(5):531-537. doi: 10.1177/1099800417711584. Epub 2017 Jun 19. PMID: 28627225
75. *Yousef K, Crago E, Lagattuta T, Hravnak M. Clinical presentation to the emergency department predicts subarachnoid hemorrhage-associated myocardial injury (SAHMI). *Journal of Emergency Nursing*. 2018 Mar;44(2):132-138. doi: 10.1016/j.jen.2017.06.005. Epub 2017 Jul 13. PMID: 28712527
76. *Rak KJ, Kuza C, Ashcraft L, Morrison PK, Angus DC, Barnato AE, **Hravnak M**, Hershey TB, Kahn JM. Identifying Strategies for Effective Telemedicine Use in Intensive Care Units: The ConnECCT Study Protocol. *The International Journal of Qualitative Methods*. 2017; 16(1):160940691773338. DOI: 10.1177/1609406917733387
77. *Bose EL, Clermont G, Chen L, Dubrawski AW, Ren D, Hoffman LA, Pinsky MR, **Hravnak M**. Cardiorespiratory instability in monitored step-down unit patients: using cluster analysis to identify patterns of change. *J Clin Monit Comput* (2018) 32:117–126 DOI 10.1007/s10877-017-0001-7 PMID: 28229353
78. *Yousef K, Crago E, Chang Y, Lagatutta TF, Shutter L, Balzer JR, Pinsky MR, Friedlander RM, **Hravnak M**. Vasopressor Infusion after Subarachnoid Hemorrhage Does Not Increase Regional Cerebral Tissue Oxygenation. *Neuroscience Nursing*. 2018. In press.

Published Research Abstracts

1. **Hravnak M**, Hoffman LA, Zullo T, Whitman G, Clochesy J, Saul M. Atrial Fibrillation Following Coronary Artery Bypass Grafting: Prevalence, Predictors and Impact. *Circulation*. 2000; 102(18): II 512.
2. Tuite PK, **Hravnak M**. Innovations in Clinical Nurse Specialist Education: Utilizing High Fidelity Human Simulators. *Clinical Nurse Specialist*. 2003; 17(3): 145.
3. **Hravnak M**, Hoffman LA, Saul MI, Zullo T, Cuneo JF, Pellegrini RV Standard versus off-pump primary isolated CABG: comparison of complications in a matched sample. *Critical Care Medicine*. 2003; 31[12 Suppl]: A14.

4. **Hravnak M**, Miller D, Conigliaro J, Kelley M. Comparison of Symptoms and Epicardial Arterial Occlusions in African-Americans and Caucasians Undergoing Elective Cardiac Catheterization. *Critical Care Medicine*. 2004; 32 [12 Suppl]: A45.
5. **Hravnak M**, Crago E, Kong Y, Hricik A, Horowitz M. Relationship Between Race, Vasospasm and Outcomes in African-American and Caucasian Patients with Subarachnoid Hemorrhage. *Critical Care Medicine*. 2005; 23 [12 Suppl]: A22.
6. **Hravnak M**, Conigliaro J, Miller D, Kelley M. Relationship between CHD Symptoms and Revascularization Recommendations. *Critical Care Medicine*. 2005; 23 [12 Suppl]: A22.
7. Crago E, **Hravnak M**, Kong Y, Sherwood P, Horowitz M. Relationship of catecholamines on markers of myocardial ischemia in patients with subarachnoid hemorrhage. *Critical Care Medicine*. 2005; 23 [12 Suppl]: A 102.
8. Tanabe M, Horowitz MB, Cannesson M, **Hravnak M**, Crago EA, Gorcsan J. The relationship between regional left ventricular wall motion and troponin-I Levels in patients with subarachnoid hemorrhage: *Journal of American College of Cardiology*. 2006; 47: 368A.
9. **Hravnak M**, Crago E, Kong Y, Horowitz MB. Prevalence of electrocardiographic abnormalities in patients with subarachnoid hemorrhage. *American Journal of Critical Care*. 2006; 15: 324.
10. **Hravnak M**, Crago C, Horowitz M. Prolonged QT interval after aneurysmal subarachnoid hemorrhage. *Critical Care Medicine*. 2006; 34 [12 Suppl]: A81.
11. Tanabe M, Crago EA, **Hravnak M**, Horowitz MB, Gorcsan J. (2007). Relationship of mild troponin-I elevations to cardiac function and pulmonary congestion in patients with subarachnoid hemorrhage. *Journal of American College of Cardiology*. 2007; 49 [Suppl. 1]: 322A.
12. Tanabe M, Crago EA, **Hravnak M**, Horowitz MB, Gorcsan J. Relationship of Acute Cardiac Dysfunction with Clinical Severity of Subarachnoid Hemorrhage: Results from the SAHMII Study. *Journal of American College of Cardiology*. 2007; 49 [Suppl. 1], 338A.
13. **Hravnak M**, Crago E, Hricik A, Horowitz MB. Relationship between serum glucose and outcomes in patients with subarachnoid hemorrhage. *American Journal of Critical Care*. 2007; 1: 303.
14. **Hravnak M**, Edwards L, Foster-Heasley M, Clontz A, Valenta C, DeVita M, Pinsky M. Electronic Integrated Monitoring of Medical Emergency Team Calls to a Step Down Unit. *Circulation*. 2007; 116: II-939.
15. Frangiskakis JM, Tanabe M, **Hravnak M**, Crago EA, Gorcsan J, Horowitz MB, London B. The MinK G38S polymorphism associates with atrial arrhythmias after subarachnoid hemorrhage. *Circulation*. 2007; 116: II-521.
16. **Hravnak M**, Edwards L, Clontz A, Valenta C, DeVita MA, Pinsky MR. Use of an

- Integrated Monitoring System to Detect Cardiorespiratory Instability According to Medical Emergency Team Call Criteria on a Stepdown Unit. *Critical Care Medicine*. 2007; 35 [12 Suppl]: A146.
17. **Hravnak, M.**, Crago, Miketic, J., Chang, Y., Horowitz, MB. (2007) Admission Serum Glucose and Outcomes in Patients with Subarachnoid Hemorrhage. *Critical Care Medicine*. 2007; 35[12 Suppl]: A12.
 18. Crago E, Sherwood P, Hricik A, **Hravnak M**, Bender C, Chang Y, Horowitz M, Kassam A. The relationship between myocardial dysfunction and 12 month neuropsychological outcomes in patients following aneurysmal subarachnoid hemorrhage. *Critical Care Medicine*. 2007; 35[12 Suppl]: A204.
 19. **Hravnak M**, DeVita M, Edwards L, Clontz A, Valenta C, Pinsky MR. Cardiorespiratory instability before and after implementing an integrated monitoring system. *American Journal of Respiratory and Critical Care Medicine*. 2008; 177: A 842.
 20. **Hravnak M**, DeVita M, Clontz A, Valenta C, Pinsky M. (2008). Ability of an electronic integrated monitoring system to affect duration of patient instability on a step-down unit. *American Journal of Critical Care*. 2008; 17(3): 279.
 21. **Hravnak M**, DeVita M, Edwards L, Clontz A, Valenta C, Pinsky MR. Incidence and duration of patient instability on a stepdown unit before and after implementing an electronic integrated monitoring system—rapid response system impact. *Intensive Care Medicine, Intensive Care Medicine*. 2008; 34 [1 Suppl]: S 119.
 22. **Hravnak M**, Frangiskakis M, Crago E, Gallek MJ, Chang Y, Horowitz MB. Elevated cardiac troponin I and electrocardiographic and echocardiographic abnormalities after aneurysmal subarachnoid hemorrhage. *Intensive Care Medicine*. 2008; 34 [1 Suppl]: S116
 24. **Hravnak M**; Frangiskakis JM, Poloyac S, Yao J, Crago E; Thampatty P, Chang P, Gorcsan J, Horowitz M. Relationship Between Catecholamines and Neurocardiac Injury in Patients with Aneurysmal Subarachnoid Hemorrhage. *Critical Care Medicine*. 2009; 37[12 Suppl]: A 152.
 25. Yousef K, Crago E, Kuo C, **Hravnak M**. Predictors of ventricular ectopy after aneurysmal subarachnoid hemorrhage. *Critical Care Medicine*. 2009; 37 [12 Suppl]: A 158.
 26. Turk MW, Sereika SM, Yang K, **Hravnak M**, Ewing LJ, Burke LE. Use of behavioral strategies for weight maintenance after a behavioral weight loss trial, *Annals of Behavioral Medicine*. 2010; 39 [Suppl]: S90.
 27. **Hravnak M**, Poloyac S, Yao J, Crago E, Thampatty B, Yousef K, Horowitz M. Relationship Between Catecholamines and Complications in Patients with Aneurysmal Subarachnoid Hemorrhage. *Intensive Care Medicine*. 2010; 36 [Suppl 2]: S321 (939).
 28. **Hravnak M**, DeVita MA, Edwards L, Clontz A, Valenta C, Pinsky MR. Impact of duration of cardiorespiratory instability in stepdown unit patients upon outcomes. *Intensive Care Medicine*. 2010. 36 [Suppl 2] : S163 (312).

29. Yousef K, Crago E, Kuo C, Horowitz M, **Hravnak, M**. Elevated Intracranial Pressure Predicts Poor Function and Death after Subarachnoid Hemorrhage. *Critical Care Medicine*. 2010; 38 [12 Suppl]: A327.
30. Ott LK, **Hravnak M**, Clark S, Amesur N. Characteristics and outcomes of hospital in-patients experiencing instability in the radiology department. *American Journal of Critical Care*. 2011; 20:e48-e86; doi:10.4037/ajcc2011139.
31. **Hravnak M**, Thampatty P, Poloyac S, Yao J, Crago E, Horowitz M. Persistence of monoamines in aneurysmal subarachnoid hemorrhage patients with myocardial injury. *Intensive Care Medicine*. 2010; 36: [1 Suppl]: 318.
32. **Hravnak M**, Thampatty B, Poloyac S, Yao J, Crago E, Horowitz M. Persistently elevated monoamines are associated with severity of aneurysmal subarachnoid hemorrhage. *Intensive Care Medicine*. 2011; 37 [1 Suppl]: S30.
33. **Hravnak M**, Thampatty B, Poloyac S, Yao J, Crago E, Horowitz M. Monoamine relationship to blood load following aneurysmal subarachnoid hemorrhage. *Critical Care Medicine*. 2011. 39: [Suppl 12]:
34. Thampatty B, Poloyac S, Yao J, Crago E, Horowitz M, **Hravnak M**. Endogenous monoamine metabolites and relationship to gender after aneurysmal subarachnoid hemorrhage. *Critical Care Medicine*. 2011. 39: [Suppl 12]: 147
35. Bose E, **Hravnak M**. Psychometric analysis of the Charlson Comorbidity Index Deyo Method. *Critical Care Medicine*. 2012. 40 [12 Suppl]: 20
36. **Hravnak M**, Chang Y; Price TJ; Crago E, Horowitz M. Impact of Myocardial Injury after Subarachnoid Hemorrhage (SAHMI) Upon Perfusion. *Critical Care Medicine*. 2012; 40 [12 Suppl]: 812.
37. **Hravnak M**, Chen L, Bose E, Fiterau M, Guillame-Bert M, Dubrawski A, Clermont G, Pinsky MR. Artifact patterns in continuous noninvasive monitoring of patients. *Intensive Care Medicine*. 2013; 39 [2 Suppl]: S405.
38. Fiterau M, Dubrawski A, Chen L, **Hravnak M**, Clermont G, Pinsky MR. Automated identification of artifacts in monitoring critically ill patients. *Intensive Care Medicine*. 2013; 39 [2 Suppl : S470. PMID 2522138.
39. Guillame-Bert M, Dubrawski A, Chen L, **Hravnak M**, Pinsky M, Clermont G. Learning temporal rules to forecast instability in intensive care patients. *Intensive Care Medicine*. 2013; 39 [2 Suppl]: S470.
40. **Hravnak M**, Chang Y; Price TJ; Crago E, Jankowitz B, Friedlander RM. Cerebral perfusion pressure is lower in patients with myocardial injury after subarachnoid hemorrhage. *Intensive Care Medicine*. 2013; 39 [2 Suppl]: S216.

41. **Hravnak M**; Chen L, Bose E, Fiterau M, Guillame-Bert M, Dubrawski A, Clermont G, Pinsky MR. Real alerts and artifact in continuous non-invasive vital sign monitoring: Mono-vs. Multi-process. *Critical Care Medicine*. 2013; 41 [12 Suppl]: A66.
42. Holder AL, Guillame-Bert M, Chen K, Huggins P, Dubrawski A, **Hravnak M**, Pinsky MR, Clermont G. Does advanced treatment of existing physiologic data allow for earlier detection of occult hemorrhage? *Journal of Critical Care*. 2013; 28 [6]:e43.
43. Holder AL, Guillame-Bert M, Chen K, Huggins P, Dubrawski A, **Hravnak M**, Pinsky MR, Clermont G. Is there an information hierarchy among hemodynamic variables for early identification of occult hemorrhage? *Journal of Critical Care*. 2013; 28 [6]:e37-38.
44. **Hravnak M**, Chen L, Fiterau M, Dubrawski A, Clermont G, Guillame-Bert M, Bose E, Pinsky MR. Active machine learning to increase annotation efficiency in classifying vital sign events as artifact or real alerts in continuous noninvasive monitoring. *American Journal of Respiratory and Critical Care Medicine*. 2014 : A3627, 10.1164/ajrccm-conference.2014.189.1_MeetingAbstracts.A3627
45. **Hravnak M**, Chen L, Dubrawski A, Clermont G, Bose E, Fiterau M, Guillame-Bert M, Pinsky MR. Supervised Machine learning can classify artifact in multi-signal vital sign monitoring data from Step-Down Unit (SDU) Patients. *Intensive Care Medicine*. 2014. 40[1 Suppl]: S29
46. Wang D, Chen L, Fiterau M, Dubrawski A, **Hravnak M**, Bose E, Wallace D, Kaynar M, Clermont G, Pinsky MR. Multi-tier ground truth elicitation framework with application to artifact classification for predicting patient instability. *Intensive Care Medicine*. 2014; 40[1 Suppl]: S289.
47. Fiterau M, Dubrawski A, Chen L, **Hravnak M**, Clermont G, Bose E, Guillame-Bert M, Pinsky MR. Artifact adjudication for vital sign step-down unit data can be improved using Active Learning with low-dimensional models. *Intensive Care Medicine*. 2014; 40[1 Suppl]: S289.
48. **Hravnak M**, Chang Y, Crago E. Impact of Age On Perfusion Abnormalities in Patients with Myocardial Injury after Subarachnoid Hemorrhage. *Critical Care Medicine*. 2014; 42 [12 Suppl]: 551.
49. **Hravnak M**, Chen L, Dubrawski A, Wang D, Bose E, Clermont G, Pinsky MR. Random Forest Models Separate Vital Sign Events as Real or Artifact in Continuous Monitoring Data. *Critical Care Medicine*. 2014; 42 [12 Suppl]: 42.
50. Chen L, Dubrawski A, **Hravnak M**, Clermont G, Pinsky MR. Forecasting cardiorespiratory instability in monitored patients: A machine learning approach. *Critical Care Medicine*. 2014; 42 [12 Suppl]: 41.
51. Fiterau M, Dubrawski A, **Hravnak M**, Chen L, Pinsky MR, Clermont G, Bose E. Archotyping artifacts in monitored noninvasive vital signs data. *Critical Care Medicine*. 2014; 42 [12 Suppl]: 51.
52. Bose E, **Hravnak M**, Clermont G. Vector auto-regressive (VAR) model for exploring causal dynamics of cardiorespiratory instability. *Critical Care Medicine*. 2014; 42 [12 Suppl]: 283.

53. Wang D, Fiterau M, Dubrawski A, **Hravnak M**, Clermont G, Pinsky MR. Interpretable active learning in support of clinical data annotation. *Critical Care Medicine*. 2014; 42 [12 Suppl]: 797.
54. **Hravnak M**, Yousef KM, Chang Y, Crago E, Friedlander RM. Persistence of Systemic and Cerebral Perfusion Impairment in Patients with Neurocardiac Injury after Subarachnoid Hemorrhage. *Intensive Care Medicine Experimental*. 2015, 3(Suppl 1):A777. doi:10.1186/2197-425X-3-S1-A777
55. Fiterau M, Bose E, Chen L, Guillame-Bert M, Wang D, Clermont G, Dubrawski A, **Hravnak M**, Pinsky MR. Semi automated adjudication of vital sign alerts in step-down units *Intensive Care Medicine Experimental* 2015, 3(Suppl 1):A769 doi:10.1186/2197-425X-3-S1-A769. PMID 27290353
56. Guillame-Bert M, Dubrawski A, Chen L, **Hravnak M**, Clermont G, Pinsky MR. Forecasting escalation of cardio-respiratory instability using noninvasive vital sign monitoring data *Intensive Care Medicine Experimental* 2015, 3(Suppl 1):A590 doi:10.1186/2197-425X-3-S1-A590. PMID 27290157
57. **Hravnak M**, Chen L, Dubrawski A, Wang D, Bose E, Clermont G, Kaynar AM, Wallace D, Holder A, Pinsky MR Machine Learning Can Classify Vital Sign Alerts as Real or Artifact in Online Continuous Monitoring Data. *Intensive Care Medicine Experimental* 2015, 3(Suppl 1):A550 doi:10.1186/2197-425X-3-S1-A550 PMID 27290362. PMC 4797909.
58. Crago, E., Chang, Y., Yousef, K., Lagatutta, T., Poloyac, S., **Hravnak, M.** (2015, October). Elevated Plasma Estrogen Levels Are Associated With Neurocardiac Injury After Aneurysmal Subarachnoid Hemorrhage. *Neurocritical Care*; (2017); 27 (suppl 2) 397.
59. Yousef KM, Lagattuta TF, Chang Y, Crago E, Pinsky MR, **Hravnak M.** (2015). The Impact of Norepinephrine Administration on Cerebral and Peripheral Tissue Oxygen Saturation after Subarachnoid Hemorrhage. *Neurocritical Care*. 2015; 23 Supplement: S227
60. **Hravnak M**, Chen L, Dubrawski A, Clermont G, Pinsky MR. Cardiorespiratory instability alert subtypes in monitored step-down unit patients have low entropy. *Critical Care Medicine*. 2015; 43 [12 Suppl]:88.
61. **Hravnak M**, Yousef K, Chang Y, Crago B, Lagatutta T, Pinsky MR Noninvasive cardiac output monitoring to evaluate neurocardiac injury after subarachnoid hemorrhage. *Critical Care Medicine*. 2015; 43 [12 Suppl]:476.
62. Chen L, **Hravnak M**, Dubrawski A, Clermont G, Pinsky MR. Predicting risk progression trajectory for Cardiorespiratory Instability in continuously monitored Step-down Unit patients. *Critical Care Medicine*. *Critical Care Medicine*. 2015; 43 [12 Suppl]:823.al

63. Bose E, Clermont G, Chen L, Dubrawski AW, Pinsky MR, *Hravnak M*. Characterizing Initial Cardiorespiratory Instability Patterns In Monitored Step-Down Unit Patients. *Critical Care Medicine*. 2015: 43 [12 Suppl]:150.
64. Fiterau M, Wang J, Dubrawski AW, Clermont G, **Hravnak M**, Pinsky MR. Using expert review to calibrate semi-automated adjudication of vital sign alerts in step-down units. *Critical Care Medicine*. 2015: 43 [12 Suppl]:10.
65. Crago E, Chang Y, Yousef K, Lagattuta T, **Hravnak M**. Relationship between cerebral tissue oxygenation, blood pressure, and cardiac output after subarachnoid hemorrhage. *Critical Care Medicine*. 2015: 43 [12 Suppl]:486.
66. Qi Z, Sugahara M, Crago E A, Chang Y, Lagattuta T F, Yousef K, Friedlander R M, **Hravnak M T**, Gorcsan J. Dispersion of left ventricular segmental peak longitudinal strain as a new marker of neurocardiac injury in patients with subarachnoid hemorrhage. *J Am Soc Echocardiogr*. 2016 Jun;29(6): B121
67. Qi Z, Sugahara M, Crago E A, Chang Y, Lagattuta T F, Yousef K, Friedlander R M, **Hravnak M T**, Gorcsan J. Changes in echocardiographic global longitudinal strain are associated with degree of neurocardiac injury in patients with subarachnoid hemorrhage. *J Am Soc Echocardiogr*. 2016 Jun;29(6): B88
68. Qi Z, Sugahara M, Crago EA, Chang YF, Lagattuta TF, Yousef K, Friedlander RM, **Hravnak MT**, Gorcsan J. Association of global longitudinal strain with severity of neurocardiac injury in patients with subarachnoid hemorrhage. Accepted to the American College of Cardiology National Meeting 2016. *J Am Coll Cardiol*. 2016, 67(13_S):1610-1610 doi:10.1016/S0735-1097(16)31611-4
69. Qi Z, Sugahara M, Crago EA, Chang YF, Lagattuta TF, Yousef K, Friedlander RM, **Hravnak MT**, Gorcsan J. Neurocardiac injury in patients with subarachnoid hemorrhage is associated with regional left ventricular discoordination. Accepted to the American College of Cardiology National Meeting 2016. *J Am Coll Cardiol* 2016; 67 (13_S): 1460-1460. doi:10.1016/S0735-1097(16)31461-9.
70. **Hravnak M**, Chen L, Dubrawski A, Clermont G, Pinsky MR. Machine Learning Can Reduce Rate of Monitor Alarms. *Critical Care* 2016, Volume 20 Suppl 2: 148. DOI 10.1186/s13054-016-1208-6
71. Chen L, Clermont G, **Hravnak M**, Pinsky MR, Dubrawski AW. A framework for visual tracking of risk and its drivers in monitoring patients susceptible for cardiorespiratory instability. The American Medical Informatics Association Annual Symposium Proceedings, 2016;2016:31-32
72. **Hravnak M**, Chen L, Dubrawski A, Clermont G, Pinsky MR. The value of progressively accrued information during initial post-admission hours in forecasting future cardiorespiratory instability. *Intensive Care Medicine Experimental*. 2016. 4[Suppl 1]:A39
73. Chen L, **Hravnak M**, Clermont G, Pinsky MR, Dubrawski A . Cardiorespiratory instability risk escalation patterns: an association study with risk factors and length of stay. *Intensive Care Medicine Experimental*. 2016; 4[Suppl 1]:A1101

74. **Hravnak M**, Yousef KM, Chang Y, Crago E, Friedlander RM. Cerebral regional tissue oxygenation in patients with neurocardiac injury after subarachnoid hemorrhage. *Intensive Care Medicine Experimental*. 2016; 4 [Suppl 3]: A403
75. **Hravnak M**, Chen L, Dubrawski A, Clermont G, Pinsky MR. Machine learning can pre-identify patients at risk for cardiorespiratory instability before a medical emergency team call. *Critical Care Medicine*. 2016; 44[12 Suppl 1]: 102. PMID: 27849742
76. **Hravnak M**, Yousef KM, Fisher AM, Lagattuta TF. Neurocardiac injury predicts functional disability after aneurysmal subarachnoid hemorrhage. *Critical Care Medicine*. 2016; 44[12 Suppl 1]: 261. PMID 27850377
77. Ratay C, Guttendorf J, Shutter L, Chou S, Morrow B, Christensen K, **Hravnak M**. Multidisciplinary fever management in stroke patients. *Critical Care Medicine*. 2016; 44[12 Suppl 1]: 274. PMID 27850431.
78. Yousef Y, Crago E, Lagattuta T, **Hravnak M**. Admission predictors of subarachnoid hemorrhage-associated myocardial injury. *Critical Care Medicine*. 2016; 44[12 Suppl 1]: 259. PMID 27850370
79. Chen L, Clermont G, **Hravnak M**, Pinsky MR, Dubrawski A. Personalized cardiorespiratory instability risk evolution among continuously monitored patients. *Critical Care Medicine*. 2016; 44[12 Suppl 1]: 129. PMID: 27849850
80. Yousef K, Crago E, Chang Y, Lagattuta T, **Hravnak M**. Vasopressor use in subarachnoid hemorrhage: Does it improve cerebral oxygenation? *Critical Care Medicine*. 2016; 44[12 Suppl 1]: 97. PMID: 27849722
81. Yousef KM, Kagiya N, Crago E, Lagattuta T, Mahmoud K, Friedlander RM, Gorcsan J, **Hravnak M**. Modest Elevation in Troponin Predicts Functional Myocardial Impairment by Echocardiogram After Aneurysmal Subarachnoid Hemorrhage. *Intensive Care Medicine Experimental* 2017, 5(Suppl 2):0412
82. Chen L, Dubrawski A, Clermont G, Pellathy T, Pinsky MR. **Hravnak M**. Incremental Utility of Laboratory Results over Demographics and Vital Signs in Predicting Future Cardiorespiratory Instability. *Intensive Care Medicine Experimental* 2017, 5(Suppl 2):0399
83. Kagiya N, Sugahara M, Hasselberg N E, Crago E A, Lagattuta T F, Yousef K M, **Hravnak M T**, Gorcsan J III. Biventricular cardiac dysfunction in neurocardiac injury assessed by strain imaging is associated with in hospital mortality in subarachnoid hemorrhage. *Circulation*. 2017;136:A17482
84. Kagiya N, Sugahara M, Hasselberg N E, Crago E A, Lagattuta T F, Yousef K M, **Hravnak M T**, Gorcsan J III. Biventricular strain as a new marker of severity of neurocardiac injury in patients with subarachnoid hemorrhage. *Circulation*. 2017;136:A18370

85. Crago E, Kagiya N., Sugahara M, Fisher A, Chang Y, Lagattuta T, **Hravnak M**, Gorcsan J III. Reduced Global Longitudinal Strain is Associated with Poor Memory Performance at 3 and 12 after Aneurysmal Subarachnoid Hemorrhage. *Neurocritical Care* (2017); 27 (suppl 2) 397.
86. Wertz A, **Hravnak M**, Dubrawski A, Chen L, Pellathy T, Clermont G, Pinsky MR. Sampling Frequency For Machine Learning to Separate Monitoring Artifact from Instability. *Critical Care Medicine*. 2018; 46: 19. DOI: 10.1097/01.ccm.0000528093.59059.9e
87. **Hravnak M**, Yousef KM, Kagiya N, Sugahara M, Crago E, Mahmoud K, Lagattuta T, Gorcsan Persistent Global Longitudinal Strain Abnormality By Echocardiogram Predicted by Cardiac Troponin I. *Critical Care Medicine*. 2018; 46: 19. DOI: 10.1097/01.ccm.0000528094.36189.50
88. Crago E, Kagiya N, Sugahara M, Fisher A, Chang Y, Lagattuta T, Gorcsan J, *Hravnak M*. Reduced Global Longitudinal Strain is Associated with Poor Executive Function after aSAH. *Critical Care Medicine*. 2018; 46: 347. DOI: 10.1097/01.ccm.0000528736.23120.85
89. Crago E, Kagiya N, Sugahara M, Mallampalli G, OHandley A, Chang Y, Gorcsan J, **Hravnak M**, Poloyac S. Elevated Plasma Estradiol is Associated with Global Longitudinal Strain after aSAH. *Critical Care Medicine*. 2018; 46:15. DOI: 10.1097/01.ccm.0000528086.90447.08.
90. Pellathy T, Saul M, Nagpal C, Clermont G, Dubrawski AW, Pinsky MR, **Hravnak M**. Accuracy of identifying venous thromboembolism by administrative coding compared to manual review. *Critical Care Medicine*. 2018; 46: 85. DOI: 10.1097/01.ccm.0000528224.97123.e0
91. Kagiya N, Soyama Y, Crago EA, Sugahara M, Hasselberg NE, Lagatutta TF, Yousef KM, **Hravnak M**, Gorcsan J. Quantification of reverse takotsubo pattern in patients with subarachnoid hemorrhage by longitudinal global strain *Journal of the American College of Cardiology*. 2018; 71(11):A1464. DOI: 10.1016/S0735-1097(18)32005-9
92. *Nagpal C, Miller K, Boecking B, Pellathy T, **Hravnak M**, Clermont G, Pinsky M, and Dubrawski A. “Semi-supervised prediction of comorbid rare conditions using medical claims data”.2018 Proceedings IEEE International Conference on Data Mining Workshops (ICDMW). DOI: 10.1109/ICDMW.2017.68
93. Wang X, Chen L, **Hravnak M**, Clermont G, Pinsky MR, Dubrawski A. Utility of Anti-hypertension Prescription Orders in Predicting Future Hypertensive Instability Events. *AMIA Annu Symp Proceedings*. 2017: 2236
94. Nobuyuki Kagiya, Yuko Soyama, Elizabeth A. Crago, Theodore F. Lagattuta, Khalil M. Yousef, **Marilyn T. Hravnak**, John Gorcsan, III. Left atrial strain is a new marker of neurocardiac injury predictive of pulmonary edema in patients with subarachnoid hemorrhage. *J Am Soc Echocardiogr*. 2018 (In press)
95. **Hravnak M**, Crago E, Chang Y, Mahmoud K, Yousef KM, Lagattuta T, Fisher A, Pinsky MR, Friedlander RM. Elevated Cardiac Troponin I is Associated with Lower Blood Pressure on the

- First Admission Day after Aneurysmal Subarachnoid Hemorrhage. *Intensive Care Medicine Experimental*. 2018; vol 6(suppl 2):40.
96. Chen L, Dubrawski A, Clermont G, Pellathy T, Wertz A, Pinsky MR, Hravnak M. Model Based Estimation of Instability Severity Level in Continuously Monitored Patients. *Intensive Care Medicine Experimental*. 2018; in press
 97. Pellathy T, Chen L, Clermont G, Dubrawski A, Pinsky MR, Hravnak M. Identifying Time-Interval Features Predictive of Hospital-Acquired Venous Thromboembolism (VTE). *Critical Care Medicine*. 2019 (in press).
 98. Chen L, Clermont G, Pellathy T, Wertz A, Yoon J, Pinsky MR, Dubrawski A, Hravnak M. Stratifying Severity of Instability in Continuously Monitored Patients. *Critical Care Medicine*. 2019 (in press).
 99. Hravnak M, Crago E, Fisher A, Chang Y, Yousef KM, Mahmoud K, Lagattuta T, Pinsky MR, Friedlander RM. Lower Blood Pressure After Subarachnoid Hemorrhage Associated To Late Neuropsychological Dysfunction. *Critical Care Medicine*. 2019 (in press).
 100. Yousef KM, Crago E, Fisher A, Mahmoud K, Lagattuta T, Hravnak M. Grading Scales in Subarachnoid Hemorrhage: Which Scale to Control for When Studying Outcomes? *Critical Care Medicine*. 2019 (in press).
 101. Crago E, Kagiya N, Fisher A, Chang Y, Lee C, Lagattuta T, Gorcsan III J, Hravnak M. Global Longitudinal Strain may be a Determinate in Quality of Life after Aneurysmal SAH. *Critical Care Medicine*, 2019 (in press).
 102. Sheng J, Chen L, Xu Yichong, Pinsky MR, Hravnak M, Dubrawski AW. Using comparisons to reduce cost of data annotation required to train models for bedside monitoring. *Critical Care Medicine*, 2019 (In press).

Unpublished Abstracts

1. **Hravnak M**, DeVita MA, Edwards LA, Clontz A, Valenta C, Pinsky MR. Impact of Duration of Cardiorespiratory Instability in Step-down Unit Patients Upon Outcomes. Poster presentation at 6th International Conference on Rapid response Systems. May 10-11, 2010. Pittsburgh PA.
2. Ott L. **Hravnak M**. Failure to Rescue: Patient Instability in the Radiology Department. Poster presentation at Eastern Nursing Society Annual Research Conference. March 2010.
3. Bose E, **Hravnak M**. Early Physiological Predictors of Cardiorespiratory Instability in Step-down Unit Patients. Poster Presentation at 25th Annual Scientific Session- Eastern Nursing Research Society. April 17-19, 2013. Boston, MA.
4. Evatt M., **Hravnak M.**, Tuite PK, Reynolds C., Ren D (2013). Development and Implementation of an Educational Support Process for Electronic Nursing Admission Assessment Documentation. Paper presentation. Capital International Nursing Conference. Beijing China.

5. Bose E, Chen L, Pinsky MR, **Hravnak M.** Diurnal variation in vital sign alerts according to Medical Emergency Team (MET) trigger criteria in continuously monitored step-down unit (SDU) patients. *International Conference of Rapid Response Teams and Systems* meeting, Miami FL. May 12, 2014.

Reviews, Invited Published Papers, Proceedings , Monographs

1. **Hravnak, M.** (1991). Conditions of the respiratory tract: Respiratory insufficiency and failure. In: Lippincott *Manual of Nursing Practice*. (5th ed.). Philadelphia: J.B. Lippincott Co.
2. **Hravnak, M.**, George, E. (1993). Nurse training and preparation for a ventricular assist device program. In: *Beyond IntraAortic Balloon Pumping*. Philadelphia: C.V. Mosby.
3. Lyness, A.L., **Hravnak M.**, Albrecht S.A., Martich, D. & Hazy J.C. (1995). Actualizing theory to practice: Preparing for computerized information system research on a critical care unit. *Proceedings: MEDINFO 95*, p. 1386-1389.
4. Lyness, A.L., **Hravnak M.** & Martich, D. (1997). Nurses' Perception of Impact of a Computerized Information System on a Critical Care Unit. Proceedings, U. Gerdin, Ed., *Nursing Informatics*, IOS Press.
5. **Hravnak, M.** Rosenzweig, M., Rust, D., Magdic, K. (1998). Organizational Considerations Related to Acute Care Nurse Practitioner Practice; Scope of practice, credentialing and privileging. In Kleinpell, R & Piano, M.(Eds.). *Advanced Practice Nursing: Roles and Issues*. New York: Springer Publishing Co.
6. **Hravnak, M.** Rosenzweig, M., Rust, D., Magdic, K. (1998). Reimbursement, liability and insurance. In Kleinpell, R & Piano, M.(Eds.). *Advanced Practice Nursing: Roles and Issues*. New York: Springer Publishing Co.
7. Kohr, L. & **Hravnak M.** (2001). Clinical practice guidelines and protocols guide decisions. *AACN News*, 18 (4), 4.
8. Kleinpell R., **Hravnak, M.** (2002). The Acute Care Nurse Practitioner. In *Advanced Nursing Practice: Building Curriculum for Quality Nurse Practitioner Education*. Eds. Crabtree M.K. & Pruitt R. Washington DC: National Organization of Nurse Practitioner Faculties.
9. **Hravnak M** Conigliaro J, Miller, D, Kelley M. (2005). The influence of race on the relationship between subjective symptoms of coronary heart disease and delay in resenting for care by African-Americans and Caucasians. *Proceedings: AACN 2nd Annual National Teaching Institute*, p. 573.
10. **Hravnak M**, Blevins CS. (2006). Practice alerts to include rating for levels of evidence. *AACN News*, 23(4), 5.
11. Crago E., Sherwood, P., Tanabe, M., Hricik, A., Chang, Y., **Hravnak, M.**, Horowitz, H., Kassam, A., Gorcsan, J., Bender, C. (2008). The Relationship Between Myocardial Dysfunction and 12 Month Neuropsychological Outcomes in Patients following Aneurysmal Subarachnoid

Hemorrhage. *Proceedings, National State of the Science Congress on Nursing Research Council for the Advancement of Nursing Science*. Washington, DC.

Book Chapters and Books

1. **Hravnak, M.** (1991). Conditions of the respiratory tract: Respiratory insufficiency and failure. In: Lippincott *Manual of Nursing Practice*. (5th ed.). Philadelphia: J.B. Lippincott Co.
2. **Hravnak, M.,** George, E. (1993). Nurse training and preparation for a ventricular assist device program. In: *Beyond IntraAortic Balloon Pumping*. Philadelphia: C.V. Mosby.
3. **Hravnak, M.** Rosenzweig, M., Rust, D., Magdic, K. (1998). Organizational Considerations Related to Acute Care Nurse Practitioner Practice; Scope of practice, credentialing and privileging. In Kleinpell, R & Piano, M.(Eds.). *Advanced Practice Nursing: Roles and Issues*. New York: Springer Publishing Co.
4. **Hravnak, M.** Rosenzweig, M., Rust, D., Magdic, K. (1998). Reimbursement, liability and insurance. In Kleinpell, R & Piano, M.(Eds.). *Advanced Practice Nursing: Roles and Issues*. New York: Springer Publishing Co.
5. **Hravnak, M,** Kleinpell, R. Magdic, K., Guttendorf, J. (2004). The Acute Care Nurse Practitioner. In *Advanced Nursing Practice: An Integrative Approach*. 2nd Ed. Eds. Hamric A.B., Spross, J.A. & Hanson, C.M. St. Louis: Elsevier Saunders Inc.
6. **Hravnak, M,** Kleinpell, R. Magdic, K., Guttendorf, J. (2008). The Acute Care Nurse Practitioner. In *Advanced Nursing Practice: An Integrative Approach*. 3rd Ed. Eds. Hamric A.B., Spross, J.A. & Hanson, C.M. St. Louis: Elsevier Saunders Inc.
7. **Hravnak M,** Schmid-Massocolli A, Ott L, Pinsky MR. (2010) Causes of failure to rescue. In *Rapid Response Systems: Concept and Implementation*. 2nd Ed. New York. Springer Inc.
8. Kleinpell, R. **Hravnak, M** , Magdic, K., Guttendorf, J. (2013). The Acute Care Nurse Practitioner. In *Advanced Nursing Practice: An Integrative Approach*. 5th Ed. Eds. Hamric A.B., Hanson, C.M., Tracey MF & O' Grady ET. St. Louis: Elsevier Saunders Inc.
9. **Hravnak M,** Mazzocoli A, Bose E, Pinsky MR. (2017) Causes of failure to rescue. In *Rapid Response Systems: Concept and Implementation*. 3rd Ed. New York. Springer Inc.
10. **Hravnak, M** , Guttendorf J, Magdic, K., Kleinpell, R. Widmar, B. (2018). The Acute Care Nurse Practitioner. In *Advanced Nursing Practice: An Integrative Approach*. 6th Ed. Eds. Hamric A.B., Hanson, C.M., Tracey MF & O' Grady ET. St. Louis: Elsevier Saunders Inc.

RESEARCH

Research Grants

development of machine learning algorithms applied to massive electronic health record clinical data repositories. Such models have the recognize pattern changes in a patient's condition forecasting a VTE event, thereby enabling earlier nurse identification and intervention, and decreasing the development of complications and failure to rescue in hospitalized patients. This award will provide a treserch and trianng plan to support the predoctoral candidate wtoards an indpenet reserch career.

Quality Improvement Project (MPI Hravnak/Pinsky) 2/2011-
present

University of Pittsburgh Medical Center (unfunded QI Project)

Predicting Cardiorespiratory Instability in Step-down Unit Patients

This study goal is to develop mechanisms to predict cardiorespiratory instability in step-down unit patients.

PAST

Role: Principal Investigator

Dates: June 1998.

Type: Professional Organization

Funding Agency: Sigma Theta Tau, Eta Chapter

Title: *Prevalence, Predictors, & Impact of Atrial Fibrillation Following Coronary Artery Bypass Grafting.*

Award: \$1,000

Role: Principal Investigator

Dates: 7/1/00-6/31/03

Type: Central Research Development Fund

Funding Agency: University of Pittsburgh

Title: *Comparison of Atrial Fibrillation Following Standard and Off Pump Coronary Artery Bypass Grafting*

Award: \$16,000

Role: Principal Investigator

Dates: 9/1/03-8/31/06

Type: 1 KO1 NR008560-01

Funding Agency: NIH, NINR

Title: *Racial Disparities in Health Outcomes Following CABG*

Award: \$286,596 (direct costs)

Role: Co-Investigator

Dates: 4/01/04-3/31/11

Type: R01HL074316 (Horowitz-PI)

Funding Agency: NIH, NHLBI

Title: *Myocardial Ischemia and Vasospasm in Aneurysmal SAH*

Award: \$2,896,764 (direct costs)

1R01NR013912

9/27/12-6/30/16

3.0 calendar

MPI: Hravnak PI corresponding; Pinsky PI

NIH/NINR

\$292,919

Predicting Patient Instability Noninvasively for Nursing Care (PPINNC)

The study goal is to apply complexity modeling-based algorithms to predict cardiorespiratory instability in noninvasively monitored step-down unit patients prior to overt instability with sufficient lead-time and

accuracy to support a nursing decision for preemptive therapy, and use this information to develop a clinical decision support tool for nurses.

Role: Principal Investigator

Dates: 7/06-2/2011

Type: Quality Improvement Project

Funding Agency: UPMC

Title: *The Impact of Information Obtained Via BioSign™ Monitoring Upon Patient and System Outcomes*

Award: Unfunded

1R01HL120980

7/28/14-5/31/18

0.6 calendar

Co-I (Kahn PI)

NHLBI

Organizational Determinants of ICU Telemedicine Effectiveness

The overall goal of this project is to identify the key clinical and organizational factors associated with ICU telemedicine effectiveness. This research will answer the single most important outstanding research question regarding ICU telemedicine: why do some programs save lives, while others fail?

PhD DISSERTATION CHAIR/SPONSOR--STUDENT FUNDING

Role: PhD Dissertation Chair/Sponsor (Chuang PI)

Date: 1/1/2009

Young Investigators Award

Society of Critical Care Medicine

\$1,500

Neuroglobin Genetic Polymorphisms and Their Relationship to Functional Outcome Following Traumatic Brain Injury

The purpose of this study is to identify functional or non-functional variants in the neuroglobin (Ngb) gene in severe traumatic brain injury (TBI) patients and determine whether variants impact patients' injury severity and functional outcomes. Aims are to identify Ngb variants (present/absent) in DNA extracted from the cerebral spinal fluid and blood of patients with severe TBI, and then: 1) determine the variant frequencies, 2) determine demographic and clinical patient characteristics based on Ngb variants, 3) determine the relationship between the variants and TBI severity as measured by admission Glasgow Coma Scale (GCS), and 4) determine differences in functional outcomes (Glasgow Outcome Scale [GOS]) at 3,6,12, and 24 months post TBI based on Ngb variants.

Role: PhD Dissertation Chair/Sponsor (Miketic PI)

Dates: 9/1/09-8/31/10

Leslie A. Hoffman Endowed Research Award

School of Nursing, U. of Pittsburgh

\$2,100

Diabetic Coronary Heart Patients' Adherence to Cardiac Rehabilitation Programs

The purpose of this prospective, descriptive study is to explore if differences exist in the Patients Profiles and Illness Contextual Factors between coronary artery disease (CAD) and type 2 diabetes mellitus and coronary artery disease (T2DM+CAD) patients entering a cardiac rehabilitation program and explore if differences exist in program adherence and program outcomes (change in functional status and illness severity markers) at program conclusion.

Role: PhD Dissertation Chair/Sponsor

1F31NR012343-01 (Ott-PD)

Dates: 5/2010-5/2013

NIH, NINR

National Research Service Award

\$ 111,388.00

Failure to Rescue: Patient Instability in the Radiology Department

The major goal is for the predoctoral candidate to conduct a study investigating the characteristics of patients who become unstable during radiologic procedures, and determine characteristic influences on poor outcomes. This information will provide the pilot work to further investigate the in-patient population most at-risk for instability during radiologic procedures, and to develop interventions that will improve patient outcomes, including but not limited to education and practice improvement. A training plan has been established to accomplish this proposed study, establish a research trajectory in patient instability, and develop skills as an independent researcher.

Sponsor PhD Dissertation Chair/Sponsor (Bose PI)

Leslie A. Hoffman Endowed Research Award 2013

Dates: 9/1/13-8/31/15

School of Nursing, U. of Pittsburgh

\$3,053

Noninvasive Monitoring Artifacts-Identification and Detection (NIMA-ID)

The purpose of this study is to identify and describe the characteristics of commonly occurring artifacts in noninvasive bedside monitoring, develop artifact semantics based on signal pattern morphology for identification of artifacts, and develop computational approaches for artifact detection.

Educational Grants

Role: Training Faculty

7/1995-6/1998

Type: 1 D23 NU01188

Funding Agency: HRSA, Division of Nursing

Title: *Adult Acute Care Nurse Practitioner Training Grant.*

Award: \$594,049 (direct costs).

Role: Training Faculty

7/1999-6/2001

Type: D23-NU0188

Funding Agency: HRSA, Division of Nursing

Title: *Adult Acute Care Nurse Practitioner Training Grant*

Award: \$255,848 (direct costs).

Role: Training Faculty

7/2004 – 6/2008

Type: 1 DO9 HPo3322

Funding Agency: HRSA, Division of Nursing

Title: *Advanced Nurse Training: Trauma/Emergency Preparedness*

Award: \$629,270 (direct costs).

OTHER SCHOLARLY ACTIVITIES

Editorial Boards

1998-2001 Editorial Board Member. *AACN Clinical Issues in Critical Care.*

Manuscript Reviewer for Refereed Journals

1991-present. *Heart and Lung*

2000-present. *The American Journal of Critical Care.*

2007-present *Journal of Critical Care*

2009-present *Journal of Cardiovascular Nursing*

Consultations

- 1994-Present Consultant regarding Acute Care Nurse Practitioner education
- 1995 Contributor: Curriculum Guidelines and Program Standards for Nurse Practitioner Education; National Organization of Nurse Practitioner Faculties
- 1996 Acute Care Nurse Practitioner Program Development.
 University of Maryland
 Kent State University
 University of Missouri
 University of Texas
 University of New York at Buffalo
- 2001-2003 Consultant on Training Grant "Acute Care Nurse Practitioner: Addressing Workforce Needs"
 Arizona State University
 Department of Health and Human Services, Division of Nursing
- 2008 Invited Member, The Second Rapid Response System Afferent Limb **Consensus Conference**. May 6-7, 2008; Sheraton, Ontario, Canada. Invited group convened prior to the 4th International Conference on Rapid Response Systems. Purpose is to develop a consensus paper on the afferent arm of Rapid Response Systems (ICU Outreach).

UNPUBLISHED PRESENTATIONS

International Presentations Area of Specialization

1. **Hravnak, M.** (August, 1998). "Nurse Practitioners in the Acute Care Setting". National Black Nurses Association Symposium. Phoenix, AZ. 20 minute presentation and panel member. Representative for National Organization of Nurse Practitioner Faculties. (January, 1999). Nurse Practitioners in Critical Care. Society of Critical Care Medicine 28th Educational and Scientific Symposium, San Francisco, CA. 20 minute presentation and panel member.
2. **Hravnak, M.** (February, 2000). "Who Should Do Outcomes Research of Advanced Practice Nurses? Society of Critical Care Medicine, 29th Educational and Scientific Symposium, Orlando FL. 20 minute presentation and panel member.
3. **Hravnak, M.** (January, 2005). "Nursing Year in Review—Communication With Mechanically Ventilated Patients". Society of Critical Care Medicine 34th Educational and Scientific Symposium. Phoenix, AZ. 20 min presentation.
4. **Hravnak, M.** (January, 2006). "Nursing Year in Review". Society of Critical Care Medicine 35th Congress. San Francisco CA. 1 hour: presenter, organizer, moderator.

5. **Hravnak, M.** (May , 2007). Electronic Integrated Monitoring of Medical Emergency Team Calls to a Step Down Unit. 3rd International Conference for Medical Emergency Treatment/Rapid Response Systems Conference. Pittsburgh, PA
6. **Hravnak, M.** (October, 2007). “Rapid Response Systems and the Use of Electronic Integrated Monitoring”. Visiting Professor Lecture. Universtattspital Basel (University Hospital of Basel), Basel, Basel Switzerland.
7. **Hravnak, M.** (October, 2007). “Using Technology to Detect Critical Changes in Patient Condition—Strategies for Success”. Visiting Professor Lecture, School of Nursing Doctoral Student Presentation, University of Basel, Basel, Switzerland.
8. **Hravnak, M.** (May, 2010). “Causes for Failure-To-Rescue: Detection and Monitoring”. 6th International Conference for Medical Emergency. Rapid Response Systems Conference. Pittsburgh, PA.
9. **Hravnak M, Saval R, Gorman MJ.** (September, 2011) “Evolving Definitions of the ICU Team”. Third in a Webinar Series on The ICU Workforce by the Society of Critical Care Medicine.
10. **Hravnak M.** (January 2013). “Where to Get Funding for My Nursing Research?” Society of Critical Care Medicine, 42nd Congress, San Juan, Puerto Rico.
11. **Hravnak M.** (March 2012). “Ventilator Associated Pneumonia” Shanghai ICU Nurses Association. Shanghai, China.
12. **Hravnak M, Chen K, Saul M, Clermont G, Dubrawski A, Pinsky M.** (June 2013). Using Data Driven Approaches to Improve Care: Examples Through the Eyes of the Clinician. INFORMS Healthcare 2013. Chicago IL.
13. **Hravnak M.** (October 2013) Cerebral perfusion pressure is lower in patients with myocardial injury after subarachnoid hemorrhage. European Society of Intensive Care Medicine. Paris, France.
14. **Hravnak M.** (December 2013). Machine Learning for Clinical Care: Examples and Current Directions. Neural Information Processing Systems Foundation Conference. Lake Tahoe, CA
15. **Hravnak M.** The Epidemiology of the Rapid Response System: What, Where, When and Why? (January, 2014). Society of Critical Care Medicine 43rd Scientific Congress. San Francisco, CA. 20 min.
16. **Hravnak M.** (March, 2014) Quality Measures for ICU Nursing. Shanghai ICU Nurses Association. Shanghai, China. 1 hour
17. **Hravnak M.** (March, 2014). Neurocardiac Injury after Aneurysmal Subarachnoid Hemorrhage--Prior Research and Future Directions. Fudan University, Nursing Research Salon. Shanghai, China. 30 minutes

18. **Hravnak M.** 5-12-2014. “Nursing Year In Review.” International Conference of Rapid Response Teams and Systems. Miami, FL
19. **Hravnak M.** 5-12-2014. “Failure-To-Rescue: The Nursing Component”. International Conference of Rapid Response Teams and Systems. Miami, FL
20. **Hravnak M.** 5-12-2014. “Training the Team: Simulation Education for AFFERENT and Efferent Arm Clinicians”. International Conference of Rapid Response Teams and Systems. Miami, FL
21. **Hravnak M.** 9-27-14. *Keynote Address*. 2014 Shanghai International Nursing Conference, Critical Care Track. “Quality Indicators for ICU Nursing”. Shanghai, China
22. **Hravnak M.** 1-18-15. “Finding a Funding Source for my Research”. Society of Critical Care Medicine 44th Scientific Congress. Phoenix, AZ
23. **Hravnak M.** Year in Review for Quality and Safety. 45th Annual Scientific Sessions. Society of Critical Care Medicine. February 22, 2016. Orlando FL.
24. **Hravnak M.** Year in Review for Quality and Safety. 47th Annual Scientific Sessions. Society of Critical Care Medicine. January 24, 2017. Honolulu HI.
25. **Hravnak M.** Alarm Fatigue: A Serious Threat to Patient Safety. Keynote Speaker, Nursing Forum, Oriental Congress of Cardiology, May 26, 2017. Shanghai, China
26. **Hravnak M.** Alarm Fatigue: A Serious Threat to Patient Safety. Presentation at Zhongshan Hospital for Zhongshan nurses and Fudan University Students. May 27, 2017. Shanghai, China
27. **Hravnak M.** Modest Elevation in Troponin Predicts Functional Myocardial Impairment by Echocardiogram After Aneurysmal Subarachnoid Hemorrhage. European Society of Intensive Care Medicine Scientific Meeting. September 26, 2017. Vienna, Austria
26. **Hravnak M.** Incremental Utility of Laboratory Results over Demographics and Vital Signs in Predicting Future Cardiorespiratory Instability. European Society of Intensive Care Medicine Scientific Meeting. September 25, 2017. Vienna, Austria
27. **Hravnak M.** Persistent Global Longitudinal Strain Abnormality By Echocardiogram Predicted by Cardiac Troponin I. 48th Annual Scientific Sessions. Society of Critical Care Medicine. February 25, 2018. San Antonio TX
28. **Hravnak M.** A Call to Alarms: Current State and Future Directions in the Battle Against Alarm Fatigue. International Society of Computerized Electrocardiography Scientific Meeting. April 27, 2018. Park City, UT.

National Presentations Area of Specialization

1. **Hravnak, M.** (November, 1992). “Ongoing Development of the Critical Care Information System: The Collaborative Approach to Automating Information Management in an Intensive

- Care Unit”. 16th Annual Symposium on Computer Application in Medical Care (SCAMC), American Medical Informatics Association. Baltimore, MD. 20 min. paper presentation.
2. **Hravnak, M.** (April, 1993). “Critical Care Applications for Bedside Technology: Multidisciplinary Collaboration for Success”. 8th Annual Seminar on Computers and Nursing Practice, New York University Medical Center. New York, NY. 45 min presentation.
 3. **Hravnak, M.** (May, 1993). “Implementation of a Critical Care Information System: Nursing Lessons Learned”. 20th Annual National Teaching Institute, American Association of Critical Care Nurses. Anaheim, CA. 90 minute presentation.
 4. **Hravnak, M.** (October, 1993). “The Future of Cardiothoracic Nursing”. Perspectives in Cardiothoracic Nursing Conference, University of Michigan. Detroit, MI. Closing Address, 1 hour presentation.
 5. **Hravnak, M.** (October, 1993). “Computers in the ICU: Nursing’s Proactive Role”. Perspectives in Cardiothoracic Nursing Conference, University of Michigan. Detroit, MI. 1 hour presentation.
 6. **Hravnak, M.** (October, 1993). “Management of Chronic LVAD Percutaneous Lead Insertion Sites.” Eighth Annual Mellen Conference, Case Western Reserve University, Cleveland, OH. 20 minute poster presentation.
 7. **Hravnak, M.** (May, 1995). “Controversies in the Practice of Acute Care Nurse Practitioners”. 22nd National Teaching Institute, American Association of Critical Care Nurses, New Orleans, LA. 1.25 hour presentation.
 8. **Hravnak, M.** (May, 1995). “The Cutting Edge of Cardiothoracic Surgery”. 22nd National Teaching Institute, American Association of Critical Care Nurses, New Orleans, LA. 1.25 hour presentation.
 9. **Hravnak, M.** (December, 1995). “Negotiating the Role of the Advanced Practice Nurse With the Employer” American Association Colleges of Nursing, Master’s Education Conference. 1 hour presentation.
 10. **Hravnak, M.** (May, 1996). “Credentialing and Privileging: An insight into the process for acute care nurse practitioners”. ACNP Consensus conference. Hartford, CT. 20 min presentation.
 11. **Hravnak, M.** (October, 1996). “The Acute Care Nurse Practitioner Role: Getting Started”. American Association of Critical Care Nurses Leadership Institute. Pittsburgh, PA 1.25 hours presentation.
 12. **Hravnak, M.** (May, 1997). “The Acute Care Nurse Practitioner Role: Getting Started”. American Association of Critical Care Nurses. National Teaching Institute. Orlando, FL. 1.25 hour presentation.

13. **Hravnak, M.** (May, 1997). “Credentialing and Privileging for Advanced Practice Nurses: Why and How”. American Association of Critical Care Nurses. National Teaching Institute. Orlando, FL. 1.25 hours presentation.
14. **Hravnak, M.** (October, 1997). “Collaborative Partnerships in Acute Care”. Pulmonary Medicine Conference, INOVA Health System, Fairfax, VA. .5 hour presentation.
15. **Hravnak, M.** (April, 1998). “Acute Care Nurse Practitioner: What Lies Ahead?” 6th Annual Acute Care Nurse Practitioner Conference, Pittsburgh PA. .5 hour presentation.
16. **Hravnak, M.** (May, 1998). “A Systematic Approach To Chest X-Ray Interpretation”. American Association of Critical Care Nurses, National Teaching Institute (Advanced Practice Institute Track). Los Angeles, CA. 3 hour clinical mastery session.
17. **Hravnak, M.** (May, 1999). “A Systematic Approach To Chest X-Ray Interpretation”. American Association of Critical Care Nurses, National Teaching Institute (Advanced Practice Institute Track). New Orleans, LA. 3 hour clinical mastery session.
18. **Hravnak, M.** (November, 1999). “Malpractice, Liability and Reimbursement for Advanced Practice Nurses”. American Heart Association, 72nd Scientific Symposium. Atlanta, GA. 20 minute presentation and panel member.
19. **Hravnak, M.** (April, 2000). “The State of Educational Program Approval for Nurse Practitioners”. 8th Annual Acute Care Nurse Practitioner Conference. Chicago, IL. 1 hr presentation.
20. **Hravnak, M.** (May, 2000). “The Differential Diagnosis of Radiographic Lung Abnormalities”. American Association of Critical Care Nurses, national Teaching Institute (Advanced Practice Institute Track). Orlando FL. 1.25 hour presentation.
21. **Hravnak, M.** (November, 2000). “Reimbursement for Advanced Practice Nurses”. American Heart Association Symposium. New Orleans, LA. 30 minute presentation and panel.
22. **Hravnak, M.** (November, 2000). “Atrial Fibrillation: Prevalence, Predictors and Impact”. American Heart Association Scientific Symposium 2000. New Orleans, LA.
23. **Hravnak, M.** (May, 2001). “Who Should Conduct Outcomes Research on Advanced Practice Nurses?” American Association of Critical Care Nurses, National Teaching Institute (Advanced Practice Institute Track). Anaheim, CA. 30 minute presentation.
24. **Hravnak, M.** (June, 2003). “Mastering the Art of Pattern Recognition on Chest X-Rays: The Differential Diagnosis of Radiographic Lung Abnormalities”. American Academy of Nurse Practitioners, 18th Annual National Conference. Anaheim, CA. 3 hour presentation.
25. **Hravnak, M.** (May 2004). “Comparison of resource utilization in standard versus off-pump primary isolated CABG”. American Association of Critical Care Nurses National Teaching Institute. Orlando, FL.

26. **Hravnak, M.** (June, 2004). “Mastering the Art of Pattern Recognition on Chest X-Rays: The Differential Diagnosis of Radiographic Lung Abnormalities”. American Academy of Nurse Practitioners, 19th Annual National Conference. New Orleans LA. 3 hour presentation. (Due to ~500 attendees at this presentation last year, was asked to repeat for East Coast).
27. ***Hravnak M,** Hoffman LA, Saul MI, Zullo T, Cuneo JF, Pellegrini RV. (2004) Comparing resource utilization in matched subjects undergoing standard versus off-pump primary isolated CABG. Proceedings: AACN 31st Annual National Teaching Institute, p. 342.
28. Tuite, P.K. & **Hravnak, M.** (2004). Innovations in Clinical Nurse Specialist Education: Utilizing High Fidelity Human Simulators. American Nurses Association Biennial Convention, Minneapolis, MN, June 27-29, 2004 (Poster Presentation)
29. **Hravnak, M.** (April, 2005). “High Fidelity Human Simulation in Nurse Practitioner Education”. National Organization of Nurse Practitioner Faculties 31st Annual Meeting. Chicago IL. Panel.
30. **Hravnak, M.** (May 2005). “The Influence of Race on the Relationship Between Coronary Disease Subjective Symptoms and Delay in Presenting for Care”. American Association of Critical Care Nurses National Teaching Institute. New Orleans, LA.
31. **Hravnak, M.** (May, 2006). “Engaging and Transforming: Using AACN Practice Alerts to Change Practice”. American Association of Critical Care Nurses National Teaching Institute. Anaheim, A. 20 minutes.
32. **Hravnak, M.** (May 2006). Prevalence of electrocardiographic abnormalities in patients with subarachnoid hemorrhage. American Association of Critical Care Nurses National Teaching Institute, Anaheim, CA
33. **Hravnak, M.** (May 2007). Relationship Between Serum Glucose and Outcomes in Patients with Subarachnoid Hemorrhage. American Association of Critical Care Nurses National Teaching Institute, Atlanta, GA.
34. **Hravnak, M.** (May, 2008). Alveolar vs. Interstitial Infiltrates: What’s the Differential? American Association of Critical Care Nurses National Teaching Institute. Advanced Practice Institute. Chicago, IL. 1.25 hour.
35. **Hravnak, M.** (April 2009). A Holistic Approach to DNP Program Development for ACNPs. National Organization of Nurse Practitioner Faculties. 35th Annual Meeting. Portland OR. 30 min.
36. **Hravnak M** & Clontz AS (May 2009). ICU Outreach Through Rapid Response Systems: A Call To Arms. American Association of Critical Care Nurses National Teaching Institute. New Orleans LA. 1.25 hours
37. **Hravnak M.** Peer Review for Advanced Practice Nurses. (May 2010). American Association of Critical Care Nurses National Teaching Institute. Washington DC. 1.25 hours.
38. **Hravnak M;** Chen L, Fiterau M, Dubrawski A, Clermont G, Guillame-Bert M, Bose E, Pinsky MR. Active machine learning to increase annotation efficiency in classifying vital sign

events as artifact or real alerts in continuous noninvasive monitoring. American Thoracic Society. San Diego, CA. 10 min research podium

37. **Hravnak M. *Keynote Address***. “Performing Research That Saves Lives: A Necessity, a Right, and a Privilege for Nurses”. Nursing Consortium of South Florida Inc. Generating Evidence for Education and Clinical Practice Conference, October 31, 2014.
38. **Hravnak M.** Causes of Failure to Rescue: Implications for Rapid Response Systems. State of the Science 2015: Best Practices in Critical Care. Baptist Health System, June 6, 2014. Miami FL.
39. **Hravnak M.** Clinical Instability in Monitored Patients. The State and Promise of Nowcasting and Forecasting. State of the Science 2015: Best Practices in Critical Care. Baptist Health System, June 6, 2014. Miami FL.
40. **Hravnak M.** and Dubrawski A. Novel Framework in Driving Decisions Using Data. “Using Machine Learning to Mitigate Preventable Death in the Inpatient Settings”. Inaugural Johns Hopkins Research Symposium on Engineering in Healthcare. Johns Hopkins University, November 21, 2016. Baltimore MD

Regional Presentations Area of Specialization

1. **Hravnak, M.** (October, 1992). “Arterial Line Monitoring”. Critical Care Nursing Course, Cambria County Consortium and the University of Pittsburgh Johnstown Campus. Johnstown, PA. 1.5 hour presentation.
2. **Hravnak, M.** (March, 1993). “Central Venous Pressure and Multiple Lumen Catheters” Critical Care Nursing Course, Cambria County Consortium and the University of Pittsburgh Johnstown Campus. Johnstown, PA. 1.5 hour presentation.
3. **Hravnak, M.** (October, 1997). Intubation Skills. Workshop to teach intubation skills to respiratory therapists and paramedics. Mercy-Bon Secours Health System, Altoona, PA. 4 hours presentation.
4. **Hravnak, M.** (May, 2000). “A Systematic Approach to Chest X-Ray Interpretation”. Horizons Region 1. New England Region American Association of Critical Care Nurses. Boston, Massachusetts. 3 hour Mastery Session.
5. **Hravnak, M.** (October, 2000). “Differentiating Radiographic Lung Abnormalities”. Southwestern Pennsylvania Nurse Practitioners Association. Pittsburgh, PA. 1 hour presentation
6. **Hravnak, M.** (October, 2000). “CXR—The Basics”. Three Rivers Chapter American Association of Critical Care Nurses. Regional Teaching Institute. Wexford, PA. 1 hour presentation.

7. **Hravnak, M.** (September, 2002). “Chest Radiograph Interpretations: Beyond the Basics”. Third Annual Clinical Challenges in Pulmonary Nursing. Pennsylvania Thoracic Society. 1.5 hours presentation.
8. **Hravnak, M.** (March, 2008). Transforming Nursing Through Evidence Based Practice: Rapid Response Systems. Nursing Symposium, Conemaugh Regional Medical System, Johnstown, PA. 1 hour presentation X 2.
9. **Hravnak M.** Improving In-Patient Nursing Care Through Technological Innovation: Using an Integrated Monitoring System to Detect Patient Instability. Drexel University Nursing Education Institute 2008, Atlantic City, NJ

Local Presentations Area of Specialization

1. **Hravnak, M.** (March, 1990). “Use of Mechanical Ventricular Assist Devices” New Horizons in Cardiac Support. Sponsored by Presbyterian-University Hospital and the University of Pittsburgh Office of Continuing Education. Pittsburgh, PA. 1.5 hour presentation.
2. **Hravnak, M.** (September, 1990). “Oxygen Transport” Presented as part of the course, Advanced Pulmonary Nursing I, University of Pittsburgh, School of Nursing, Pulmonary Clinical Specialty Program. 4 hour presentation.
3. **Hravnak, M.** (September, 1990). “Oxygen Transport” Presented as part of the course, NURSMS 2014, Nursing Care of the Acutely Ill Patient, University of Pittsburgh, School of Nursing. 4 hour presentation.
4. **Hravnak, M.** (October, 1990). Review of Policy on Foregoing Life Sustaining Therapy. Presented to Cardiothoracic Surgeons as part of Cardiothoracic Surgical Teaching Rounds, University of Pittsburgh, School of Medicine. 30 minute presentation.
5. **Hravnak, M.** (October, 1990). “Role of the Nurse Manager in the ICU” Presented to the Critical Care Medicine Physicians, University of Pittsburgh, School of Medicine. 1 hour presentation.
6. **Hravnak, M.** (November, 1990). “Clinical Specialist Role” Panel member as part of the course, NURSMS 2064 Role Seminar, University of Pittsburgh, School of Nursing. 2 hour presentation.
7. **Hravnak, M.** (March, 1991). “Principles of Acute Hemodialysis and Continuous Venous-Venous Hemofiltration” Presented to the Critical Care Medicine Physicians, University of Pittsburgh, School of Medicine. 1 hour presentation.
8. **Hravnak, M.** (June, 1991). “Implementation and Function of a Critical Care Information System” Presented to Fiscal Services Division, University of Pittsburgh Medical Center. 1 hour presentation.

9. **Hravnak, M.** (September, 1991) “Critical Care Information Systems—Nursing Implications”. Presented to the Nursing Informatics Task Force, Center for Nursing Excellence, University of Pittsburgh Medical Center. 1 hour presentation.
10. **Hravnak, M.** (December, 1992). “Technical Application of Continuous Arterial-Venous Hemofiltration”. Presented to Critical Care Medicine Training Program, University of Pittsburgh. One-half hour presentation.
11. **Hravnak, M.** (February, 1993). “Phrenic Nerve Dysfunction”. Presented to Three Rivers Chapter, American Association of Critical Care Nurses, Montefiore Hospital, Pittsburgh. 2 hour presentation.
12. **Hravnak, M.** (March, 1994). “Prevention of Iatrogenic Disability in the Hospitalized Elderly”. Benedum Geriatric Center, Pittsburgh. One-half hour presentation.
13. **Hravnak, M.** (April, 1995). “Iatrogenic Disability in the Critically Ill Elderly”. Three Rivers Chapter, American Association of Critical Care Nurses. 2 hours presentation.
14. **Hravnak, M.** (September, 1995). “Time In a Bottle: Management Considerations for the Elderly Patient”. Symposium on Pulmonary Medicine and Physiology, Pennsylvania Society of Respiratory Therapists and Pennsylvania Society of Pulmonary Medicine. 1 hour presentation.
15. **Hravnak, M.** (March, 1996). “Chest X-ray Interpretation. Horizons Conference: Vision into the Future. University of Pittsburgh School of Nursing. 1 hour presentation
16. **Hravnak, M.** (October, 1996). “Chest X-ray Interpretation” Concepts in Critical Care Conference. American Association of Critical Care Nurses, Three Rivers Chapter. 1 hour presentation.
17. **Hravnak, M.** (March, 1998). “Systematic Approach to Chest X-ray Interpretation. Horizons Conference. University of Pittsburgh School of Nursing. 1 hour presentation.
18. **Hravnak, M.** (September, 2002). “Atrial Fibrillation Following CABG: Where Are We?” Innovations 2002: Cardiothoracic Nursing Symposium. Sponsor: UPMC Presbyterian and UPMC Shadyside Cardiothoracic Nursing. Pittsburgh, PA
19. **Hravnak, M.** (October, 2000). “Atrial Fibrillation: Prevalence, Predictors and Impact”. 12th Annual Greater Pittsburgh Nursing Research Conference. Pittsburgh, PA
20. **Hravnak, M.** (May, 2004). “Standard Versus Off-Pump Primary Isolated CABG: Comparison of Complications in a Matched Sample” University of Pittsburgh School of Nursing Anniversary Celebration, Pittsburgh PA.

21. **Hravnak, M.** (April 2006). “Chest X-ray Interpretation for ICU Nurses”. Critical Care Symposium, University of Pittsburgh Medical Center, Pittsburgh, PA. 1 hour.
22. **Hravnak, M.** (February, 2007) “Disparities in Symptoms and Disease Severity in African American Patients With Coronary Heart Disease”. School of Nursing Diversity-I-Tea (Sponsored by the Diversity Committee)
23. Clontz A, Edwards L, Valenta C, **Hravnak, M.** (June, 2007). “Improving Compliance with Pulse Oximetry Monitoring”. University of Pittsburgh Medical Center Quality Fair. Pittsburgh, PA. *Senior Investigator on the project, won 2nd place in Patient Safety Award category.*
24. **Hravnak, M.** (June, 2007). “Electronic Integrated Monitoring of Medical Emergency Team Calls to a Step Down Unit”. University of Pittsburgh Medical Center Quality Fair. Pittsburgh, PA.
25. **Hravnak, M.** (May, 2008). Using an Electronic Integrated Monitoring System to Detect Patient Instability--Evidence and Implications for Nursing Practice. Nursing Horizons Conference, University of Pittsburgh School of Nursing, Pittsburgh PA. 30 minute presentation.
25. **Hravnak, M.** (October, 2009). Infiltrates on the Chest X-Ray. UPMC Critical Care Symposium. University of Pittsburgh Medical Center, Pittsburgh, PA. 1 hr presentation.
26. **Hravnak, M.** (October, 2012). Developing and Implementing the Critical Care Clinical Nurse Specialist in China. Speaker in “A World of Opportunities: Experiences in International Nursing”. Sigma Theta Tau, Eta Chapter Founders Day, Pittsburgh, PA. 30 minutes
27. **Hravnak M.** (December, 2015). Machine Learning: Pattern recognition in big (and little) data. School of Nursing Technology T-32 Methodology Series. Pittsburgh, PA. 1 hr presentation.
28. **Hravnak M.** (June 2017). Data Collection Using Technology: The Case of Using Online Clinical Data to Decrease Alarm Fatigue and Provide Real-Time Clinical Decision Support. Jewish Healthcare Foundation QI²T Health Innovators Fellowship. Pittsburgh, Pennsylvania. Panel Presentation

TEACHING

Primary Teacher

Term/Year s	Course Number & Title	No. of Student s	Level	Didactic or Clinical

Fall 2005-2010	MSELCT 2900 Basic Science of Care. Course based in the School of Medicine, School of Nursing Representative and coordinator. Also PBL Learning Group Leader (multidisciplinary students). Required core course for DNP program.	~23-25	DNP	Didactic
Fall, 2005-present	NURNP 2106 Clinical Emphasis: Critical Care	~ 6-20	MSN	Didactic and Clinical
Spring, 2005-present	NURNP 2028 Role Practicum	~2-6	MSN	Clinical
Summer; 1998-present	NURNP 2104 Management of Complex Health Problems of the Acutely and Critically Ill Adult	~14-25	MSN	Didactic and Lab
Fall 2010-present	NUR 3099 and 3499 Science of Healthcare Delivery (onsite and distance education)	40-50	DNP	Didactic
Fall 2011-present	NUR 3099 Science of Healthcare Delivery (online)	10-40	DNP	Didactic
Spring 2018-present	NUR 3289 Responsibilities and Activities of Scientists -2	5-10	PhD	Didactic

Lecturer / Guest Lecturer

Term/Year s	Course Number & Title	No. of Student s	Level	Topic of Lecture
Fall 2004-2017	NUR 3030 Research Development	~3-5	PhD	Invited speaker annually on topics relative to research implementation and planning in critical care.
Fall, Spring Summer 2004-2015	NUR 2004 Advanced Pathophysiology Across the Lifespan	~100	MSN	Cardiovascular Structure and Function
Fall, Summer 1994- Present	NUR 2033 Differential Diagnosis Theory Across the Lifespan	~100	MSN	Pulmonary Module

Spring	NURNP 2100 Mgt of Adult Episodic/Chronic Health Problems in Acute Care Theory	~6-20	MSN	CXR Interpretation Nutritional Support in Acute Care
Summer	NUR 2078 Clinical Diagnostics	~6-10	MSN	Fundamentals of CXR Interpretation

Master's Theses

Chair	9
Member	1

Doctoral Dissertations Member

Margaret Carno 2002
 Mary Wojankowski 2004
 Melanie Turk 2008
 Zhan Liang 2015

Doctoral Dissertations Chair

PeiYing Chuang
 Joyce Miketic
 Lora Ott
 Eliezer Bose
 Tiffany Pellathy (in process)

PhD—Research Doctorate Dissertation Chair

PeiYing Chuang (August 2008) Neuroglobin Genetic Polymorphisms and Their Relationship to Functional Outcome Following Severe Traumatic Brain Injury. (Dissertation: Neuroglobin Genetic Polymorphisms and Their Relationship to Functional Outcome Following Traumatic Brain Injury) (**Note: This student's dissertation work won the Young Investigator Award 2009 for the Society of Critical Care Medicine**).

Joyce Miketic (April 2009) Cardiac Rehabilitation in Patients with Diabetes Mellitus

Lora Ott (August 2012) Medical Emergency Team Calls to the Radiology Department

Eliezer Bose (August 2015) Detecting Cardiorespiratory Instability in Stepdown Unit Patients

DNP—Practice Doctorate Capstone Project Chair

Jessica Erb ACNP (April, 2011)	The Development and Evaluation of a Nursing Hypothermia Protocol for Post Cardiac Arrest Patients.
Jane Guttendorf ACNP (August 2012)	The Development of a Systematic Process to Assess and Improve the Quality of Care for Adult Patients Undergoing Extracorporeal Membrane Oxygenation (ECMO)
Lauren Saul CNS (April 2013)	An eLearning Cardiac Arrhythmia Education/Competency Program for Non-Cardiac Nurses
Manjulata Evatt CNS (April 2013)	Development and Implementation of an Educational Support Process for Electronic Nursing Admission Assessment Documentation at Unit Admission.
Kimberly Klein ACNP (August 2013)	The Development and Evaluation of a Nursing Protocol to Prevent Hypothermia During Open Abdominal Procedures.
Debra Ryan CNS April 2014	Development of a nurse-driven, interdisciplinary protocol for the provision of early mobility in Medical Critical Care Patients
Linda Ozekcin CNS April 2014	Simulation Education: Early Identification of Patient Physiologic Deterioration by Acute Care Nurses
Tracey Daum April 2015 (in process)	Implementation of an Acute Kidney Injury (AKI) Prevention Checklist During Multidisciplinary Rounds.
Cristina Greene April 2016 (in process)	Prevention of Nasogastric Tube Complications by Implementing an Evidenced-based Nasogastric Tube protocol for Nursing.
Cecilia Ratay April 2016 (in process)	Fever Management in Hemorrhagic and Ischemic Stroke Patients
Sandee Angel Rich April 2016 (in process)	A systematic Review of the Literature on the Question of the Efficacy of a Mindfulness Intervention in Increasing the Physician and Nurse's Level of Empathy
Kimberly Weinhold April 2016 (in process)	Implementation and Nursing Education of the Intensive Care Delirium Screening Checklist (ICDSC)
Daniel Lunsford April 2017 (in process)	Pain Management Protocol for Burn Patients Receiving Hydrotherapy

SERVICE

University Committees

2006-2009	Institutional Review Board	Member
2011	University Faculty Assembly	Member
2012-2013	University Senate	Member
2012	Senate Anti-Discriminatory Policy Committee	Member
2013 & 2014		Secretary
2014	Senate Anti-Discriminatory Policy Committee	Member
2014-2016	University Faculty Assembly	Member
2014-2015	University Senate	Co-Chair
	University Senate Committee on Equity, Inclusion and Anti-Discriminatory Advocacy Committee	

University of Pittsburgh School of Nursing Committees

1991-Present	Acute Care Nurse Practitioner Task Force	Chair/Member
1993-1997	Curriculum Committee	Member
1993-present	MSN Council	Member
2002-present	PhD Council	Member
2004-2006	PhD Curriculum Committee	Member
2005-2006	Diversity Committee	Member
2006-2007	Diversity Committee	Chair
2007-2008	Diversity Committee	Member
2008-2009	Diversity Committee	Chair
2008-2009	PhD Graduate and Progression Committee	Member
2009-present	DNP Council	Member

2009-2012	MSN/DNP Curriculum Committee	Chair
2010-2012	Continuing Education Committee	Member
2012-2014	Faculty and Staff Welfare Committee	Member
2013-2014	PhD Curriculum Committee	Member
2013-present	Acute & Tertiary Care Non-Tenure Stream Faculty Development	Lead
2014-2016	Faculty and Staff Welfare Committee	Chair
2014-2016	PhD Council Task Force on Curriculum Revision	Co-Chair
2015-2018	Planning and Budget Committee	Chair
2016-present	PhD Council	Chair

University of Pittsburgh Medical Center Committees

2002-2014	Allied Health Credentialing Committee; Subgroup of UPMC PUH Medical Executive Committee	CRNP Representative
-----------	---	---------------------

Community Service

10-21-04	Allegheny County Health Department Flu Vaccine Clinic (injectable)	Administered
12-15-04	School of Nursing Flu Mist Clinic	Administered

CONTINUING NURSING EDUCATION

Date	Activity Provider	Title
1992	American Association of Critical Care Nurses	National Teaching Institute. New Orleans, LA.
1993	American Association of Critical Care Nurses,	National Teaching Institute. Anaheim, CA
1993	Society of Critical Care Medicine	Scientific Symposium. New York, NY.

1994	Society of Critical Care Medicine	Scientific Symposium, Orlando, FL.
1994	University of Pittsburgh School of Medicine	Practical Approaches to Common Medical Problems Pittsburgh, PA.
1995	University of Rochester	Consensus Conference on Acute Care Nurse Practitioner Education and Practice. Rochester, NY
1996	Society of Critical Care Medicine	Scientific Symposium, New Orleans, LA
1996	American Association of Critical-Care Nurses,	National Teaching Institute, Atlanta, GA
1996	American Association of Critical Care Nursing,	Leadership Institute, Pittsburgh, PA
1997	Society of Critical Care Medicine	Scientific Symposium, San Diego, CA
1997	American Association of Critical-Care Nurses,	National Teaching Institute, Orlando, FL
1998	American Association of Critical-Care Nurses	National Teaching Institute, Los Angeles, CA
1998	Society of Critical Care Medicine	28 th Scientific and Educational Symposium, San Francisco, CA
1999	American Association of Critical-Care Nurses	National Teaching Institute, New Orleans, LA
1999	Society of Critical Care Medicine,	29 th Scientific and Educational Symposium, Orlando, FL
2000	Society of Critical Care Medicine	30 th Scientific Symposium, Orlando, FL

2000	American Association of Critical-Care Nurses	National Teaching Institute, Orlando, FL
2001	University of Pittsburgh, Pittsburgh, PA	Fundamentals of Human Subject Research,
2002	American Heart Association	Scientific Sessions 2002 Chicago, IL
2003	American Heart Association	Scientific Sessions 2003. Orlando, FL.
2003	American Academy of Nurse Practitioners	
2004	Society of Critical Care Medicine	Scientific Symposium 2004. Orlando FL
2004	American Association of Critical Care Nurses	National Teaching Institute. Orlando FL
2004	American Academy of Nurse Practitioners.	National Meeting, New Orleans, LA
2004	Society of Critical Care Medicine	Scientific Symposium 2004. Phoenix AZ
2005	National Organization of Nurse Practitioner Faculties	31 st Annual Meeting. Chicago IL.
2005	American Association of Critical Care Nurses	National Teaching Institute New Orleans, LA
2005	Society of Critical Care Medicine	Scientific Symposium, Phoenix, AZ
2005	American Heart Association,	Scientific Sessions, Chicago, IL
2006	National Organization of Nurse Practitioner Faculties	Orlando, FL

2006	American Association of Critical Care Nursing	National Teaching Institute Anaheim, CA
2006	Society of Critical Care Medicine	Scientific Symposium San Francisco, CA
2007, May	American Association of Critical Care Nurses	National Teaching Institute Atlanta, GA
2007, May	3rd International Conference for Medical Emergency Treatment/Rapid Response Systems Conference	Pittsburgh, PA
2007, January	Society of Critical Care Medicine	Scientific Symposium, Orlando, FL
2007, November	European Society of Intensive Care Medicine	Scientific Congress Berlin, GER
2007, November	American Heart Association,	Resuscitation Science Symposium, Orlando FL
2007, November	American Heart Association,	Scientific Sessions, Orlando FL
2008, February	Society of Critical Care	Scientific Symposium Medicine, Honolulu, HI
2008, May 3-5	American Association of Critical Care Nurses,	National Teaching Institute Chicago, IL
2008, May 20- 21	American Thoracic Society, Toronto ON	Annual Meeting Toronto, ON, CAN
2008, June 27	Drexel University	Drexel University Nursing Education Institute 2008, Atlantic City, NJ
2008, September 20- 24	European Society of Critical Care Medicine	Lisbon, Portugal

2009, January 31-Feb 1	Society of Critical Care Medicine	Nashville, TN
2009, April 16- 19	National Organization of Nurse Practitioner Faculties	Portland, OR
2009, May 17- 21, 2009	American Association of Critical Care Nurses, National Teaching Institute	New Orleans, LA
2010, January 9-13	Society of Critical Care Medicine	Miami, FL
2010, March 25-27	Geriatric Medicine Update	Pittsburgh, PA
2010, May	American Association of Critical Care Nurses, National Teaching Institute	Washington, DC
2010, Oct 10-13	European Society of Intensive Care Medicine	Barcelona, Spain
2011, Jan 17-20	Society of Critical Care Medicine	San Diego, CA
2011, Oct 1-5	European Society of Intensive Care Medicine	Berlin, Germany
2012, Feb 4-8	Society of Critical Care Medicine	Houston TX
2013, Jan 20-23	Society of Critical Care Medicine	San Juan, Puerto Rico
2013, Apr 11-14	National Organization of Nurse Practitioner Faculties	Pittsburgh, PA
2013 June 23-26	INFORMS Healthcare 2013.	Chicago IL
2013, Dec 5-8	Neural Information Processing Systems Foundation Conference.	Lake Tahoe, CA

2013, Oct 6-9	European Society of Intensive Care Medicine	Paris, France	
2014 Jan 20-24	Society of Critical Care Medicine	San Francisco, CA	
2014, May 7-10	International Rapid Response Systems Symposium	Miami, FL	
2014 May 16-20	American Thoracic Society Symposium	San Diego, CA	
2014 Oct 1-5	European Society of Intensive Care Medicine	Barcelona, Spain	
2015 Jan 18-21	Society of Intensive Care Medicine	Phoenix, AZ	
2015 Oct 3--7	European Society of Intensive Care Medicine	Berlin, Germany	
2016 Feb 19-24	Society of Intensive Care Medicine	San Francisco, CA	26.75
2016 May 3	Scope of Pain : Safe and Competent Opioid Prescribing Education(mandated by Commonwealth of Pennsylvania for Prescriptive Authority)	Online, Boston University School of Medicine	2
2016 Jun 3	Caring for Dying Patients in the ICU: Managing Pain, Anxiety, Delirium	American Association of Critical Care Nurses	1
2016 Jun 3	Norepinephrine Dosing in Obese and Non-Obese Patients with Septic Shock	American Association of Critical Care Nurses	1
2016 Jun 3	Pharmacologic Management of Pulmonary Arterial Hypertension	American Association of Critical Care Nurses	1
2016 Jun 3	Psychiatric Emergencies in the ICU	American Association of Critical Care Nurses	1
2016 Jun 3	Pharmacologic Treatments for ARDS	American Association of Critical Care Nurses	1
2016 Jun 3	Medication Management to Ameliorate Post-ICU Syndrome	American Association of Critical Care Nurses	1

2016 Jun 3	Update on the Management and Monitoring of Deep Analgesia and Sedation in ICU	American Association of Critical Care Nurses	1
2016 Jun 3	Management of Acute Hyperglycemic Emergencies	American Association of Critical Care Nurses	1
2016 Jun 3	Antimicrobial Resistance Thinking Outside the Box	American Association of Critical Care Nurses	1
2016 Jun 3	Aortic Stenosis: Patho, Diagnosis and Medical Management of Nonsurgical Patients	American Association of Critical Care Nurses	1
2016 Jun 3	B-Blocker and Calcium Channel Blocker Poisoning	American Association of Critical Care Nurses	1
2016 Jun 3	Effective Pain Management and Improvements in Patient Outcomes and Satisfaction	American Association of Critical Care Nurses	1
2016 Jun 3	ACS: Focus on Antiplatelet Therapy	American Association of Critical Care Nurses	1
2016 Jun 3	Application of Antibiotic Pharmacodynamics and Dosing Principles in Patients with Sepsis	American Association of Critical Care Nurses	1
2016 June 29	Recognizing and Reporting Child Abuse: Mandated and Permissive Reporting in Pennsylvania	Online	3
2016 Oct 1-5	European Society of Intensive Care Medicine	Milan, Italy	27
2016, Oct 17	Research Methodology: Introduction to Large Data Sets	University Pittsburgh School of Nursing	1.5
2017 Jan 21-25	Society of Intensive Care Medicine	Honolulu, HI	19.75
2017 Mar 6-8	Comprehensive Systematic Review Training Programme	Pittsburgh PA	? 12

2017 Sept 23-27	European Society of Intensive Care Medicine	Vienna AU	27
2018	Society of Critical Care Medicine	San Antonio TX	22
2018	European Society of Intensive Care Medicine	Paris, France	40