

Dec, 2017

Curriculum Vitae

Name: Elizabeth A. Crago, RN, MSN, PhD

Business Address: University of Pittsburgh School of Nursing
320B Victoria Building
3500 Victoria Street
Pittsburgh, PA 15261

E-Mail Address: ecrago@pitt.edu

Business Phone: (412) 624-2340

Business Fax: (412) 383-7227

Education and Training

Undergraduate

1982-1985 Uniontown Hospital Diploma
Uniontown, PA and Nursing
Penn State University
Fayette Campus
Uniontown, PA

1989 - 1992 California University of Pennsylvania B.S.N.
California, PA Nursing

Graduate

1996-1998 La Roche College M.S.N.
Pittsburgh, PA Critical-Care Nursing

2010-2012 University of Pittsburgh Ph. D.
Pittsburgh, PA Nursing

Appointments and Positions

Academic

9/2015- current University of Pittsburgh Assistant Professor
School of Nursing
Acute and Tertiary Care
Pittsburgh, PA

9/2012-8/2015 University of Pittsburgh Research Assistant Professor
School of Nursing
Pittsburgh, PA

3/2000-8/2012 University of Pittsburgh Project Director for NIH Grants
School of Nursing related to Neurological Insults
Pittsburgh, PA

1992-2012 Westmoreland County Community Instructor: Con Ed Nursing and
College Allied Health; Critical Care,
Youngwood, PA Trauma, Triage, Neurologic insult

Non-Academic

2001-present Excelsa Health Per diem staff nurse E.D., educator
Greensburg, PA Critical Care Class and E.D.
Nursing Orientation Course:
Neurological assessment, Care of

1987-2000	Westmoreland Hospital Greensburg, PA	the patient with neurological insults. Annual Stroke Education and ICP monitoring task force Staff Nurse ICU; Staff Nurse ED Assistant Head Nurse ED Care Manager ED and Med Surg Staff Nurse ICU
1985-1987	Shadyside Hospital Pittsburgh, PA	Staff Nurse ICU
1985	Peninsula General Medical Center, Salisbury, MD	Staff Nurse ICU

Licensure and Certification

1985-present	RN 285221-L	Pennsylvania
1986-present	American Heart Association	Advanced Cardiac Life Support Provider and Instructor
1986-present	American Heart Association	Pediatric Life Support Provider and Instructor
1986-present	American Heart Association	Basic Life Support Provider and Instructor
1992 - 1998	American Association of Critical Care Nurses	Critical Care Nursing Certification
1994 - 1998	Emergency Nursing Association	Emergency Nursing Certification

Membership in Professional and Scientific Societies

1990-present	American Association of Critical Care Nurses
1992-present	Emergency Nurses Association
2000-present	Society of Critical Care Medicine 2009-2011 Chair - nursing research committee , 2013-2015 Research Committee, Patient and Family Advocacy Committee 2018
2000-present	Council for the Advancement of Nursing Science
2000-present	Eastern Nursing Research Society
2004-present	American Association of Neuroscience Nurses, National Chapter
2004-present	American Association of Neuroscience Nurses, Pittsburgh Chapter
2004-present	Society of Neurocritical Care
2005-present	Society of Critical Care Medicine
2011-present	Sigma Theta Tau Nursing Society – Eta Chapter
2016 - present	International Society of Nursing Genetics

Awards and Honors

2009	Society of Critical Care Medicine Annual Scientific Award (first author)
2011	Society of Critical Care Medicine Presidential Citation
2011	Ruth Perkins Kuehn Award for Scholarship Sigma Theta Tau ETA Chapter
2011	Nightingale of Pennsylvania Scholarship Award Doctoral Student
2012	Society of Critical Care Medicine Neurology Abstract Award (Co-author)
2012	Neurocritical Care Society Distinguished Abstract (Co-author)
2013	Society of Critical Care Medicine Neurology Abstract Award (Co-author)
2013	Neurocritical Care Society Distinguished Abstract Award (first author)
2015	Society of Critical Care Medicine Neurology Abstract Award (first author)
2015	Society of Critical Care Medicine Presidential Citation
2016	Society of Critical Care Medicine Snapshot Abstract Award (first author)

- 2017 Society of Critical Care Medicine STAR Abstract Award (first author)
 2017 Society of Critical Care Medicine STAR Abstract Award (co- author)

Publications

Refereed Articles * = Data Based

1. *Lorenzi, I., Kerr, M.E., Yonas, H., Alexander, S., **Crago, E.** (2003). Influence of delaying treatment after symptoms develop from subarachnoid hemorrhage: A preliminary analysis. *Journal of Neuroscience Nursing*, 35(4), 210-214.
2. ***Crago, E.**, Kerr, M.S., Kong, Y., Baldisseri, M., Horowitz, M., Yonas, H., Kassam, A. (2004). The impact of cardiac complications on outcome in the SAH population. *Acta Neurologica Scandinavica*, 110, 248-253.
3. *Poloyac, S.M., Crago, E., Sherwood, P., Bies, R., Hoffman, L.A., Kerr, M.E. (2005). Temporal profile of 20-HETE, a CYP metabolite of arachidonic acid, in the CSF of subarachnoid hemorrhage patients. *Drug Metabolism Reviews*, 37 (4), 725.
4. *Stippler, M., **Crago, E.**, Levy, E., Kerr, M., Yonas, H., Horowitz, M., & Kassam, A. (2006). Magnesium infusion for vasospasm prophylaxis after subarachnoid hemorrhage. *Journal of Neurosurgery*, 105, 1-7.
5. Sherwood, P., & **Crago, E.** Spiro, R., & Okonkwo, D. (Cover article) (2007). Cervical spine injuries: Preserving function, improving outcomes. *American Nurse Today*, 2, 26-29.
6. *Gupta, R., **Crago, E.**, Gallek, M., Hoffman, L., Horowitz, M., Yonas, H. (2008). Reduced ipsilateral hemispheric cerebral blood flow at admission is predictive of vasospasm with infarction after aneurysmal subarachnoid hemorrhage. *NeuroCritical Care*, 9 (1), 27-30.
7. *Barr, T., Alexander, S., Kerr, M.E., **Crago, E.**, Horowitz, M.B., Yonas, H. (2008). The impact of endovascular coiling versus surgical clipping on functional outcome following intracranial aneurysm rupture. *Neurosurgery Quarterly*, 18 (1), 16-21.
8. *Kim, S.R., Vora, N., Jovin, T.G., Gupta, R., Tomas, A., Kassam, A., Lee, K., Gologorsky, Y., Jankowitz, B., Panapitiya, N., Alau, A., Sandhu, E., **Crago, E.**, Hricik, A., Gallek, M., Horowitz, M.B. (2008). Anatomic results and complications of stent-assisted coil embolization of intracranial aneurysms. *Interventional Neuroradiology*, 14, (3), 267-84.
9. *Jankowitz, B., Thomas, A., Vora, N., Gupta, R., Soong-Rim, K., Levy, E., Yamamoto, J., Kassam, A., Gologorsky, Y., Sandur, E., Panapitiya, N., **Crago, E.**, Hricik, A., Lee, K., Gallek, M., Jovin, T., Horowitz, M.B. (2008). Risk of hemorrhage and stroke in combined neuroform stenting and coil embolization of acutely ruptured aneurysms. *Interventional Radiology*, 14, 385-396.
10. *Hamilton, J., Korn-Naveh, L., **Crago, E.** (Continuing Education Article) (2008). Myocardial dysfunction after acute aneurysmal subarachnoid hemorrhage: case studies. *Journal of Neuroscience Nursing*, 40 (5), 269-274.
11. Carwile, E., Wagner, A., **Crago, E.**, Alexander, S. (Continuing Ed. Article) (2009). Estrogen and stroke: A review of the current literature. *Journal of Neuroscience Nursing*, 41(1), 18-25.
12. *Tanabe, M., **Crago, E.**, Suffoletto, M., Hravnak, M., Kassam, A., Horowitz, M., Gorcsan, J. Clinical Significance of Cardiac Troponin-I Elevations in Patients with Aneurysmal Subarachnoid Hemorrhage. (2008). *American Journal of Cardiology*, 102, 1545-50.
13. *Frangiskakis, J.M. Hravnak, M., **Crago, E.**, Tanabe, M., Kip, K., Gorcsan, J., Kassam, A., Horowitz, M., London, B. (2009). Ventricular Arrhythmia Risk After Subarachnoid Hemorrhage. *NeuroCritical Care*, 10 (3), 287-294.

14. *Hravnak, M., Frangiskakis, M., **Crago, E.**, Chang, Y., Tanabe, M., Gorcsan, J., Horowitz, M. (2009). Elevated Cardiac Troponin I and Relationship to Persistence of Electrocardiographic and Echocardiographic Abnormalities After Aneurysmal Subarachnoid Hemorrhage. *Stroke*, *40* (11), 3478-3484.
15. *Miller, T., Donnelly, M., **Crago, E.**, Roman, D., Sherwood, P., Horowitz, M., Poloyac, S. (2009). Rapid, simultaneous quantitation of mono and deoxygenated metabolites of arachidonic acid in human CSF and rat brain. *Journal Chromatography B: Biomedical Sciences and Applications*, *877*(31), 3991-4000.
16. *Newberry, A., Sherwood, P., Hricik, A., Bradley, S., Kuo, J., **Crago, E.**, Hoffman, L., Given, B. (2010). Understanding Recruitment and Retention in Neurological Research. *Journal of Neuroscience Nursing*, *42* (1), 47-57.
17. *Miketic, J., Hravnak, M., Sereika, S., **Crago, E.** (2010). Relationship between Elevated Cardiac Troponin I and Functional Recovery and Disability in Patients after Aneurysmal Subarachnoid Hemorrhage. *American Journal of Critical Care*, *19* (6), 522-528.
18. *Yousef, K. **Crago, E.**, Kuo, C.J., Horowitz, M., Hravnak, M. (2010). Predictors of delayed cerebral ischemia after aneurysmal subarachnoid hemorrhage: a cardiac focus. *NeuroCritical Care*, *13*, 366-372.
19. *Kanaan, H., Jankowitz, B., Aleu, A., Kostov, D., Lin, R., Lee, K., Panapitiya, N., Gologorsky, Y., Sandhu, E., Rissman, L., **Crago, E.**, Chang, Y., Kim, S., Jovin, T., Horowitz, M. (2010). In-Stent Thrombosis and Stenosis after Neck-Remodeling Device-Assisted Coil Embolization of Intracranial Aneurysms. *Neurosurgery*, *67* (6), 1523-32.
20. *Thampatty, B., Sherwood, P., Gallek, M., **Crago, E.**, Ren, D., Hricik, A., Kuo, J., Klamerus, M., Alexander, S., Bender, C., Hoffman, L., Horowitz, M., Kassam, A., Poloyac, S. (2011). Role of endothelin-1 in human aneurysmal subarachnoid hemorrhage: associations with vasospasm and delayed cerebral ischemia. *Neurocritical Care*, *15*(1):19-27.
21. ***Crago, E.**, Thampatty, B., Sherwood, P., Kuo, C., Bender, C., Balzer, J., Horowitz, M., Poloyac, S. (2011). CSF 20-HETE is associated with delayed cerebral ischemia and poor outcomes after aneurysmal subarachnoid hemorrhage. *Stroke*, *42* (7), 1872-7.
22. *Adkins, K., **Crago, E.**, Kuo, C. J., Horowitz, M., Sherwood, P. (2012) Correlation between emergency department symptoms and clinical outcomes in the patient with aneurysmal subarachnoid hemorrhage. *Journal of Emergency Nursing*, *38* (3), 226-233.
23. *Kim, H., **Crago, E.**, Kim, M., Sherwood, P., Conley, Y., Poloyac, S., Kerr, M. (2013). Cerebral Vasospasm after Subarachnoid Hemorrhage as a Clinical Predictor and Phenotype for Genetic Association Study. *International Journal of Stroke*, *8* (8) : 10.1111/j.1747-4949.2012.00823.PMCID PMC3475757
24. *Gallek, M., Alexander, S., **Crago, E.**, Sherwood, P., Horowitz, M., Poloyac, S., Conley, Y. (2013). Endothelin-1 and Endothelin Receptor Gene Variants and Their Association with Negative Outcomes Following Aneurysmal Subarachnoid Hemorrhage. *Biologic Research Nursing*, *15* (4), 390-397. PMID: 24852947
25. ***Crago, E.**, Kerris, K., Kuo, C.J., Sherwood, P., Hravnak, M., Crippen, D., Horowitz, M. (2014). The effect of beta blockers and ace inhibitors on cardiac abnormalities after aneurysmal subarachnoid hemorrhage. *American Journal of Critical Care*, *23* (1), 30-9. PMID: 24382615
26. *Kantor, E., Bayir, H., Ren, D., Provencio, J., Watkins, L., **Crago, E.**, Horowitz, M., Conley, Y., Alexander, S. (2014). Haptoglobin Genotype and Functional Outcome after Aneurysmal Subarachnoid Hemorrhage. *Journal of Neurosurgery*, *120* (2) 386-390. DOI: 10.3171/2013.10.JNS13219 . PMID: 24286153.

27. *Yousef, K., Balzer, J., **Crago, E.**, Poloyac, S., Sherwood, P. (2014). Transcranial regional Cerebral Oxygen Desaturation Predicts Delayed Cerebral Ischemia and Poor Outcomes After Subarachnoid Hemorrhage: A Correlational Study. *Intensive & Critical Care Nursing*, 30(6), 346-52. DOI: 10.1016/j.iccn.2014.05.001. PMID:24933608.
28. ***Crago, E.**, Sherwood, P., Bender, C., Balzer, J., Ren, D., Poloyac, S. (2014). Plasma estrogen levels are associated with severity of injury and outcomes after aneurysmal subarachnoid hemorrhage. *Biological Research in Nursing*. Epub ahead of print 2014 Dec 29. pii: 1099800414561632. PMID: 25548393.
29. *Donnelly, MK., Conley, YP, **Crago, EA.**, Ren, D., Sherwood, PR., Balzer, JR., Poloyac, SM. (2015). Genetic Markers in the EET Metabolic Pathway are Associated with Outcomes in Patients with Aneurysmal Subarachnoid Hemorrhage. *Journal of Cerebral Blood Flow Metabolism*, 35 (2) 267-76. DOI: 10.1038/jcbfm.2014.195. PMID: 25388680.
30. *Donnelly, MK., **Crago, EA.**, Conley, YP., Balzer, JR., Ren, D., Ducruet, AF., Kohanek, PM., Sherwood, PR., Poloyac, SM. (2015). 20-HETE is associated with unfavorable outcomes in subarachnoid hemorrhage patients. *Journal of Cerebral Blood Flow Metabolism*, 35(9):1515-22. Epub ahead of print 2015 Apr 29. doi: 10.1038/jcbfm.2015.75. PMID: 25920956.
31. Al-Zaiti, S., **Crago, E.**, Hravnak, M., Kozik, T., Pelter, M., Carey, M. (2015). Cardiac Dysfunction after Neurologic Injury. *American Journal of Critical Care*, 24(5):453-4. DOI: 10.4037/ajcc2015618. PMID: 26330440.
32. ***Crago, E.** Price, T.J, Bender, C, Ren, D, Poloyac, S, Sherwood, P. (2016). Impaired Work Productivity Following Aneurysmal Subarachnoid Hemorrhage. *Journal of Neuroscience Nursing*, 48(5):260-268. DOI:10.1097/JNN.0000000000000209.
33. *Panczykowski, D., Pease, M., Zhao, Y., Weiner, G., **Crago, E.**, Jankowitz, B., Ducruet, A. (2016). Prophylactic antiepileptic medications and seizure incidence following subarachnoid hemorrhage: A propensity score-matched analysis. *Stroke*, 47(7):1754-60. doi: 10.1161/STROKEAHA.116.013766. PMID:27301932.
34. *McAteer, A., Hravnak, M., Chuang, Y., **Crago, E.**, Gallek, M., Yousef, K. The Relationship Between BNP, Neurocardiac Injury Severity, Noninvasive Cardiac output, and Outcomes after Aneurysmal Subarachnoid Hemorrhage *Biological Research in Nursing*, 2017 Jan:1-7. . doi: 10.1177/1099800417711584. [Epub ahead of print] PMID:28627225
35. *Yousef, KM, **Crago, EA**, Lagatutta, TF, Hravnak, M. Clinical Presentation to the Emergency Department Predicts Subarachnoid Hemorrhage – Associated Myocardial Injury. *Journal of Emergency Nursing*. 2017 Jan 1:1099800417711584. doi: 10.1177/1099800417711584. [Epub ahead of print] PMID:28712527
36. *Stanfill, A., Simpson, C., Sherwood, P., Poloyac, S., **Crago, E.**, Kim, H., Conley, Y. A pilot study on the impact of dopamine, serotonin, and BDNF genotype on long term functional outcomes after subarachnoid hemorrhage. *SAGE Open Medicine*. 2017 Aug 31, 5:2050312117726725. Doi: 10.1177/2050312117726725.

In Review

1. ***Crago E.**, Miller T., Park S., Wagner A. Plasma IGF1 is associated with poor outcomes after aneurysmal subarachnoid hemorrhage *Neuroendocrinology*. (In review).

2. *Turi E., Conley Y., **Crago E.**, Sherwood P., Poloyac S., Ren D., Stanfill A. Psychosocial comorbidities related to return to work rates following aneurysmal subarachnoid hemorrhage. *Journal of Occupational Rehabilitation*. (In review).
3. *Heinsberg L, Turi E, Ren D, **Crago E**, Alexander S, Stanfill A, Conley Y. Association of *APOE* genotype with activities of daily living following aneurysmal subarachnoid hemorrhage. *Biologic Research in Nursing* (In press).
4. *Kagiyama N, Sugahara M, **Crago E**, Qi Z, Lagattuta T, Yousef K, Friedlander R, Hravnak M, Gorcsan J. Neurocardiac Injury Assessed by Strain Imaging is Associated with In-hospital Mortality in Patients with Aneurysmal Subarachnoid Hemorrhage. *Circulation* (In review).
5. *Yousef K, **Crago E**, Chang Y, Lagattuta T, Mahmoud K, Shutter L, Balzer J, Pinsky M, Friedlander R, Hravank M. Vasopressor Infusion after Subarachnoid Hemorrhage Does Not Increase Regional Cerebral tissue Oxygenation. *Journal of Critical Care* (In Review).

Published Abstracts

1. *Kerr M., Nemoto, E., Yonas, H., Kassam, A., **Crago, E.**, Alexander, S. (2000). Vasospasm detection following SAH using cerebral oximetry. [Abstract]. *Critical Care Medicine*, 28(Suppl. 12) A208.
2. ***Crago E.**, Kerr, M., Kassam, A., Yonas, H. (2000). Clinical presentation of fever, vasospasm and clinical neurologic deterioration following subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 28(Suppl. 12) A206.
3. *Lorenzi, L., Kerr, M.E., Yonas, H., Kassam, A., Alexander, S., **Crago, E.** (2000). Delaying treatment after symptoms develop from subarachnoid hemorrhage (SAH) on outcome: A preliminary analysis. [Abstract]. *Critical Care Medicine*, 28(Suppl. 12) A209.
4. *Ward, S., Valenta, C., **Crago, E.**, Michalic, D., Mitchell-Perry, R., Reilly, E., Kerr, M.E., Yonas, H. (2000). Implementation and evaluation of a neurologic data set for the SAH patient. [Abstract]. *Critical Care Medicine*, 28(Suppl. 12,) A210.
5. ***Crago, E.**, Kerr, M.E., Fails, M., Yonas, H. (2001). Effect of preexisting cardiac disease on cardiac complications, angiographic vasospasm and neurological deterioration following subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 29(Suppl. 12), A33.
6. *Kerr, M.E., **Crago, E.**, Alexander, S., Kim, Y., Kamboh, I, & Marion, D. (2002). Conditions associated with neurologic deterioration in the SAH patient. [Abstract]. *Critical Care Medicine*, 30(Suppl. 12), A5.
7. ***Crago, E.**, Kerr, M.E., Baldesseri, M., Horowitz, M., Kassam, A., Yonas, H. (2002). Impact of cardiac complications on outcomes in patients with subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 30(Suppl. 12), A6.
8. ***Crago, E.**, Kong, Y., Kerr, M., Yonas, H., Horowitz, M., & Kassam, A. (2003). Relationship between aneurysm site and outcomes following subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 31(Suppl. 12), A15.
9. *Beatty, M., Kerr, M., Condon, I., Kong, Y., Alexander, S., **Crago, E.**, Horowitz, M., Yonas, H. (2003). Comparison of coiling verses clipping on 6 month outcomes following subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 31(Suppl. 12), A90.
10. *Kong, Y., Kerr, M., **Crago, E.**, & Yonas, H. (2003). A multifactoral model and Lindegaard Ratio for vasospasm prediction following subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 31(Suppl. 12), A94.

11. ***Crago E.**, Kerr, M.E., Levy, E., Horowitz, M., Yonas, H., Kassam, A., Stippler, M., (2004). Effect of continuous magnesium infusion on cerebral vasospasm and 3 month outcomes following subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 32(Suppl. 12), A19.
12. *Poloyac, S., **Crago, E.**, Sherwood, P., Bies, R., Hoffman, L.A., Kerr, M.E. (2005). Temporal profile of 20-HETE, a CYP metabolite of arachidonic acid, in the CSF of subarachnoid hemorrhage patients. [Abstract]. *Drug Metabolism Reviews*, 37, 725.
13. *Hravnak, M., **Crago, E.**, Kong, Y., Hricik, A., Horowitz, M. (2005). Relationship between race, vasospasm and outcomes in African-American and Caucasian patients with subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 33(Suppl. 12), A22.
14. ***Crago, E.**, Hravnak, M., Kong, Y., Sherwood, P., Horowitz, M. (2005). Relationship of catecholamines on markers of myocardial ischemia in patients with subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 33(Suppl. 12), A 102.
15. *Tanabe, M., Horowitz, M.B., Cannesson, M., Hravnak, M., **Crago, E.A.**, Gorcsan, J. (2006). The relationship between regional left ventricular wall motion and troponin-I levels in patients with subarachnoid hemorrhage: Results of the SAHMII study. [Abstract]. *Journal of American College of Cardiology*.
16. *Hravnak, M., **Crago, E.**, Kong, Y., Horowitz, M.B. (May 2006). Prevalence of electrocardiographic abnormalities in patients with subarachnoid hemorrhage. Oral Abstract Award Winner, American Association of Critical Care Nurses National Teaching Institute, Anaheim, California. [Abstract]. *American Journal of Critical Care*, 15, 324.
17. *Hravnak, M., **Crago, E.**, Horowitz, M. (2006). Prolonged QT interval after aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 34(Suppl. 12), A81.
18. *Hravnak, M., **Crago, E.**, Horowitz, M. (2007). Relationship between serum glucose and outcomes in patients with subarachnoid hemorrhage. [Abstract]. *American Journal of Critical Care*.
19. *Tanabe, M., **Crago, E.A.**, Hravnak, M., Horowitz, M.B., Gorcsan, J. (2007). Relationship of mild troponinI elevations to cardiac function and pulmonary congestion in patients with subarachnoid hemorrhage: Results of the SAHMII study. [Abstract]. *Journal of the American College of Cardiology*, 49 (Suppl. 1), 338A.
20. *Tanabe, M., **Crago, E.A.**, Hravnak, M., Horowitz, M.B., Gorcsan J. (2007). Relationship of acute cardiac dysfunction with clinical severity of subarachnoid hemorrhage: Results of the SAHMII study. [Abstract]. *Journal of the American College of Cardiology*, 49 (Suppl. 1), 338A.
21. ***Crago, E.**, Gupta, R., Gallek, M., Chang, Y., Horowitz, M., Yonas, H. (2006). Early lower Global hemispheric CBF on initial xenon CT in patients with aneurysmal subarachnoid hemorrhage is predictive of poor 3 month outcomes. [Abstract]. *Critical Care Medicine*, 34 (Suppl. 12), A81.
22. ***Crago, E.**, Gupta, R., Gallek, M., Chang, Y., Horowitz, M., Yonas, H. (2006). Early lower ipsilateral hemispheric cerebral vasospasm after subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 32(Suppl. 12), A82.
23. *Gallek, M., Sherwood, P., **Crago, E.**, Alexander, S., Hoffman, L., Horowitz, M., & Poloyac, S. (2006) Endothelin-1 Cerebrospinal Fluid Levels are Associated with the Development of Cerebral Vasospasm in Aneurysmal Subarachnoid Hemorrhage Patients. [Abstract]. *Critical Care Medicine*, 32(Suppl. 12), A80.
24. *Hravnak, M., **Crago, E.**, Hricik, A., & Horowitz, M.B. (2007) Relationship between serum glucose and outcomes in patients with subarachnoid hemorrhage. [Abstract]. *American Journal of Critical Care*, 16, 303. (AACN Research Abstract Award Winner 2007).

25. *Sherwood, P. **Crago, E.**, Gallek, M., Hricik, A., Ren, D., Hoffman, L., Poloyac, S. (2007). Endothelin and neuropsychological outcomes in aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 35 (Suppl. 12), A202.
26. ***Crago, E.**, Sherwood, P., Tanabe, M., Hricik, A., Chang, Y., Hravnak M., Horowitz, M., Kassam, A., Gorcsan J., Bender, C. (2007). The Relationship Between Myocardial Dysfunction and 12 Month Neuropsychological Outcomes in Patients following Aneurysmal Subarachnoid Hemorrhage. [Abstract]. *Critical Care Medicine*, 35 (Suppl. 12), A204.
27. *Hravnak, M., **Crago, E.**, Miletic, J., Chang, Y., Horowitz, M. (2008). Admission serum glucose and outcomes in patients with subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 35(Suppl. 12), A12.
28. *Hricik, A.J., **Crago, E.A.**, Bender, C.M., Lu, X., Kassam, A.B., Horowitz, M.B., Hoffman, L.A. (2007). Coiling versus clipping following subarachnoid hemorrhage: 3 & 12 month evaluation of neuropsychological outcomes. [Abstract]. *Critical Care Medicine*, 35(Suppl. 12), A165.
29. ***Crago, E.**, Sherwood, P., Kuo, J., Hricik, A., Horowitz, M., Kassam, A., Poloyac, S. (2008). Cerebrospinal fluid 20-HETE is associated with poor neuropsychological outcomes after aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 36(Suppl. 12), A10. (Winner of Society of Critical Care Research Award 2009).
30. *Hravnak, M., **Crago, E.**, Frangiskakis, M., Chang, Y., Gorcsan, J., Horowitz, M. (2008). Relationship between left ventricular motion abnormalities and markers of neurocardiac injury in patients with aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 36(Suppl. 12), A10. (Winner of Society of Critical Care Research Award 2009).
31. ***Crago, E.**, Adkins, K., Kuo, C., Horowitz, M., Sherwood, P. (2009). Initial symptom presentation as a predictor of mortality and length of stay in the patient with aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 37(Suppl. 12), A159.
32. *Yousef, K., **Crago, E.**, Kuo, C., Hravnak, M. (2009). Predictors of ventricular ectopy after aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 37(Suppl. 12), A158.
33. *Hravnak M, Poloyac S, Yao J, **Crago E**, Chang Y, Gorcsan Y, Horowitz M. (2009). Relationship between catecholamines and neurocardiac injury in patients with aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 37(Suppl. 12), A152.
34. *Alexander, S., Poloyac, S., Ren, D., **Crago, E.**, Conley, Y. (2009). DDAH2 Genotype predicts outcome after subarachnoid hemorrhage. *Critical Care Medicine*, 37(Suppl. 12), A156.
35. *Watkins, L., Alexander, S., Ren, D., **Crago, E.**, Conley, Y., Kagan, V., Bayir, H. (2009). Haptoglobins containing A2 subunit favor angiographic vasospasm in aneurysmal subarachnoid hemorrhage (SAH). [Abstract]. *Critical Care Medicine*, 37(Suppl. 12), A19.
36. *Kantor, E., Conley, Y., Ren, D., Bayir, H., Provencio, J., **Crago, E.**, Horowitz, M., Alexander, S. (2009). Haptoglobin genotype and functional outcome after subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 37(Suppl. 12), A368.
37. *Yousef, K., **Crago, E.**, Kuo, C., Horowitz, M., Hravnak, M. (2010). Elevated Intracranial Pressure Predicts Poor Function and Death after Subarachnoid Hemorrhage. [Abstract]. *Critical Care Medicine*, 37(Suppl. 12), 327.
38. ***Crago, E.**, Kuo, C., Sherwood, P., Horowitz, M., Poloyac, S. (2010). Cerebrospinal fluid 20-hydroxyicosatetraenoic acid is associated with delayed cerebral ischemia and poor outcomes after aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 38(Suppl. 12), 147.

39. *Hravnak, M., Thampatty, B., Poloyac, S., Yao, J., **Crago, E.**, Horowitz, M. (2010). Persistence of Monoamines in Aneurysmal Subarachnoid Hemorrhage Patients with Myocardial Injury. [Abstract]. *Critical Care Medicine*, 38(Suppl. 12), 318.
40. *Watkins, L., Alexander, S., Alexandr, K., Ren, D., **Crago, E.**, Conley, Y., Kaga, V., Bayir, H. (2010). Possible role for haptoglobin and hemoglobin aggregates in patho-mechanism of aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 38(Suppl. 12), 154.
41. *Yousef, K, **Crago, E.**, Hamilton, J., Duursma, M., Colorito, P., Balzer, J., Sherwood, P. (2011). Relationship between mean arterial pressure and cerebral blood flow velocities in patients with subarachnoid hemorrhage. [Abstract]. *Neurocritical Care*, 15, S120.
42. ***Crago, E.**, Donnelly, M., Sherwood, P., Kuo, C., Balzer, J., Horowitz, M., Poloyac, S. (2011). The association of metabolites of arachidonic acid in CSF on the incidence of delayed cerebral ischemia after aneurysmal subarachnoid hemorrhage. [Abstract]. *Neurocritical Care*, 15, S36.
43. *Hravnak M, Thampatty B, Poloyac S, Yao J, **Crago E**, Horowitz M. (2011). Persistently elevated monoamines are associated with severity of aneurysmal subarachnoid hemorrhage. [Abstract]. *Intensive Care Medicine*, 37 [Suppl 1], S30.
44. ***Crago E**, Donnelly M, Ren D, Sherwood P, Horowitz M, Poloyac S. (2011). Cerebrospinal fluid 11-12 and 14-15 DHET after aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 39 (12), 305.
45. *Hravnak M, Thampatty B, Poloyac S, Yao J, **Crago E**, Horowitz M. (2011). Monoamine relationship to blood load following aneurysmal subarachnoid hemorrhage. [Abstract]. *Critical Care Medicine*, 39 (12), 1. (Winner Society of Critical Care Medicine Neurology Award, 2012).
46. *Yousef, K., Kuo, C., **Crago, E.**, Balzer, J., Poloyac, S., Sherwood, P. (2011). The Impact of Sodium Level on Neurologic Deterioration after Subarachnoid Hemorrhage. [Abstract]. *Critical Care Medicine*, 39 (12), 314.
47. Thampatty, B., Poloyac, S., Yao, J., **Crago, E.**, Horowitz, M., Hravnak, M. (2011). Endogenous Monoamine Metabolites and Relationship to Gender after Aneurysmal Subarachnoid Hemorrhage. [Abstract]. *Critical Care Medicine*, 39 (12), 147.
48. *Yousef, K, Choi CJ, **Crago E**, Poloyac S, Balzer J, Sherwood P (2012). Aneurysmal Subarachnoid Hemorrhage: Comparing The Performance of Grading Scales in Predicting Complications and Outcomes. [Abstract]. *Neurocritical Care*; 17: S1-S337, page S49. (*DISTINGUISHED ABSTRACT*)
49. ***Crago, E.**, Sherwood, P., Bender, C., Balzer, G., Ren, D., Poloyac, S. (2012). The Association of Cerebrospinal Fluid Estrogen Levels to Injury and Outcomes After Aneurysmal Subarachnoid Hemorrhage. [Abstract]. *Neurocritical Care*; 17: S1-S337, page S299.
50. *Hravnak, M., Chang, Y., **Crago, E.**, Price, T., Horowitz, M. (2012). Impact of Myocardial Injury After Subarachnoid Hemorrhage (Sahmi) Upon Perfusion. [Abstract]. *Critical Care Medicine*, 40(12), 1-328, December 2012. (Winner Society of Critical Care Medicine Neurology Award, 2013).
51. ***Crago, E.**, Sherwood, P., Bender, C., Balzer, J., Ren, D., Poloyac, S. (2012) The Relationship Between Plasma Estrogen Levels and Severity of Injury and Delayed Cerebral Ischemia After Subarachnoid Hemorrhage. [Abstract]. *Critical Care Medicine*, 40(12), 1-328, December 2012.
52. *Yousef, K., Balzer, J., **Crago, E.**, Poloyac, S., Sherwood, P.(2012) Transcranial Regional Cerebral Oxygen Desaturation Predicts Delayed Cerebral Ischemia and Poor Outcomes After Subarachnoid Hemorrhage. [Abstract]. *Critical Care Medicine*, 40(12), 1-328, December 2012.
53. * **Crago E**, Sherwood P, Bender, C, Balzer, J, Ren, D, Poloyac S (2013). Plasma Estrogen Levels Are Associated with Adverse Outcomes Following Acute Aneurysmal Subarachnoid

Hemorrhage.[Abstract]. *Neurocritical Care*; 19: S1-S331, page S31. (*DISTINGUISHED ABSTRACT*)

54. *Hravnak M, Chang Y; Price TJ; **Crago E**. Jankowitz B, Friedlander RM.(2013) Cerebral perfusion pressure is lower in patients with myocardial injury after subarachnoid hemorrhage. *Intensive Care Medicine*. 39(2), S216.
55. *Donnelly, M, Conley, Y, Crago, E, Sherwood, P,Balzer, J,Poloyac, S. (2013). Association of SNPS on Genes Affecting EEt Levels and Delayed Cerebral Ischemia in aSAH Patients. [Abstract]. *Critical Care Medicine*, 41(12), A63.
56. *Hravnak, M., Chang, Y., **Crago, E**. (2014). Impact of Age on Perfusion Abnormalities in Patients with Myocardial Injury after Subarachnoid Hemorrhage [Abstract]. *Critical Care Medicine*, 42 (12), A1492. (Winner Society of Critical Care Medicine Abstract Award, 2015).
57. ***Crago, E.**, Price, T., Horowitz, M. (2014). The Effect of Aneurysmal Subarachnoid Hemorrhage on Work Productivity. [Abstract]. *Critical Care Medicine*, 42(12) A1376. (Winner Society of Critical Care Medicine Neurology Award, 2015).
58. *Yousef, K., **Crago, E.**, Price, T., Lagattuta, T., Sherwood, P. (2014). Vasopressors Do Not Improve Outcomes of Delayed Cerebral Ischemia After Subarachnoid Hemorrhage [Abstract]. *Critical Care Medicine*, 42(12) A1490.
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*; 23 Supplement: S227.
60. * **Crago, E.**, Chang, Y., Yousef, K., Lagattuta, T., Poloyac, S., Hravnak, M. (2015). Elevated Plasma Estrogen Levels Are Associated With Neurocardiac Injury After Aneurysmal Subarachnoid Hemorrhage. *Neurocritical Care*; 23 Supplement: S7.
61. ***Crago, E.**, Yousef, K., Chang, Y., Lagattuta, T., Hravnak M. (2015). Relationship between cerebral tissue oxygenation and cardiac output after subarachnoid hemorrhage. *Critical Care Medicine*; 43(12 Suppl 1):120-121.
62. ***Crago, E.**, Yabes, J., Balzer, J., Triulzi, L, Ducruet, A., Sherwood, P., Poloyac, S. Aneurysmal Subarachnoid Hemorrhage Patients with elevated 20-HETE have higher Lindegaard ratios. (2015). (Winner Snapshot Abstract Award). *Critical Care Medicine*; 43(12 Suppl 1):118.
63. *Hravnak M, Yousef K, Chang Y, **Crago E**, Lagattuta T, Pinsky MR.(2015). Noninvasive cardiac output monitoring to evaluate neurocardiac injury after subarachnoid hemorrhage. *Critical Care Medicine*; 43(12 Suppl 1):123.
64. *Qi Z, Sugahara M, **Crago EA**, Chang YF, Lagattuta TF, Yousef K, Friedlander RM, Hravnak MT, Gorcsan J. (2016). Association of global longitudinal strain with severity of neurocardiac injury in patients with subarachnoid hemorrhage. *Am Coll Cardiol*. 2016, 67(13_S):1610-1610 doi:10.1016/S0735-1097(16)31611-4.
65. *Qi Z, Sugahara M, **Crago EA**, Chang YF, Lagattuta TF, Yousef K, Friedlander RM, Hravnak MT, Gorcsan J. (2016). Neurocardiac injury in patients with subarachnoid hemorrhage is associated with regional left ventricular discoordination. *J Am Coll Cardiol* 2016; 67 (13_S): 1460-1460. 10.1016/S0735-1097(16)31461-9.
66. *Qi Z, Sugahara M, **Crago E A**, Chang Y, Lagattuta T F, Yousef K, Friedlander R M, Hravnak M T, Gorcsan J. (2016). 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.

67. *Qi Z, Sugahara M, **Crago E A**, Chang Y, Lagattuta T F, Yousef K, Friedlander R M, Hravnak M T, Gorcsan J. (2016). 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
68. *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 [Supple 3]: A403.
69. *Yousef KM, **Crago EA**, Chang Y, Lagattuta TF, Hravnak M. (2016). Vasopressors Use in Subarachnoid Hemorrhage: Does it Improve Cerebral Oxygenation? *Critical Care Medicine*. 44 (12):97.
70. *Yousef KM, **Crago EA**, Lagattuta TF, Hravnak M. (2016). Admission Predictors of Subarachnoid Hemorrhage-Associated Myocardial Injury. *Critical Care Medicine* . 44 (12):259.
71. ***Crago, E.**, Miller, T., Poloyac, S., Wagner, A. (2016). The association between serum insulin growth factor and estrogen to outcomes after aneurysmal subarachnoid hemorrhage. *Critical Care Medicine*. 44 (12):263.
72. * Kagiya N, Sugahara M, **Crago EA**, Lagattuta TF, Yousef KM, Hravnak MT, Gorcsan J. 2017.Right ventricular strain as a new marker of neuro-cardiac injury in patients with subarachnoid hemorrhage *J Am Soc Echocardiography*, 30 (6).
73. * Kagiya N, Sugahara M, **Crago EA**, Lagattuta TF, Yousef KM, Hravnak MT, Gorcsan J. 2017. Reduced global longitudinal strain is associated with in-hospital mortality in patients with subarachnoid hemorrhage and preserved ejection fraction. *J Am Soc Echocardiography*, 30 (6).
74. *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; in press.
75. ***Crago E**, Nobuyuki K, Masataka S, Fisher A, Chang Y, Lagattuta T, Hravnak M, Gorcsan III J. Reduced Global Longitudinal Strain is Associated with Poor Memory Performance at 3 and 12 months after Aneurysmal Subarachnoid Hemorrhage. (2017) *Neurocritical Care*.27 (suppl 2) 397.
76. ***Crago E**, Miller T, Poloyac S, Park S, Wagner A. Plasma Insulin Growth Factor Levels are Associated with Clinical Severity and Outcomes after Aneurysmal Subarachnoid Hemorrhage. (2017) *Neurocritical Care*.27 (suppl 2) 391.
77. *Hravnak M, Yousef KM, Kagiya N, Sugahara M, **Crago E**, Mahmoud K, Lagattuta T, Gorcsan J. Persistent Global Longitudinal Strain Abnormality By Echocardiogram Predicted by Cardiac Troponin I. *Critical Care Medicine*. 2017 (in press).
78. ***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*. 2017 (in press).

79. ***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*. 2017 (in press).

Invited Articles and Position Papers

1. Sherwood, P., & **Crago, E**, Spiro, R., & Okownkwo, D. (Cover article) (2007). Cervical spine injuries: Preserving function, improving outcomes. *American Nurse Today*, 2, 26-29.
2. **Crago, E**. Core Principles of Acute Neurology: Identifying Neuroemergencies (Book Review). 2016. *Critical Care Medicine* . 45 (1):e122.

Book Chapters

1. Kerr, M.E. & **Crago, E**. (2004). Acute intracranial pressure monitoring. In S.M. Lewis, M.M. Heitkemper, & S.R. Dirksen (Eds.), *Medical-surgical nursing* (6th ed.). St. Louis: Mosby.
2. Sherwood, P., & **Crago, E**. (2007). Autonomic dysreflexia. In B. Ackley, G. Ladwig, B. Swan, & S. Tucker (Eds), *An evidence-based guide to planning care* (8th ed., pp. 157-160). St. Louis: Mosby, p. 157-160.
3. Sherwood, P., & **Crago, E**. (2007). Autonomic dysreflexia. In B. Ackley & G. Ladwig (Eds.), *Nursing Diagnosis Handbook* (8th ed).
4. Sherwood, P., & **Crago, E**. (2014). Autonomic dysreflexia. In B. Ackley, G. Ladwig, B. Swan, & S. Tucker (Eds), *Nursing Diagnosis Handbook: An evidence-based guide to planning care* (10th ed.). St. Louis: Mosby.

Research – Amounts reflect total direct costs only

Current Research

Principle Investigator

Central Research Development Fund

The Effect of IGF1 Gene Variants on Functional Outcomes after aSAH

Years Inclusive: 7/1/2017-6/30/2018

% Effort: 10%

Total Direct Costs: \$15,000.00

Principle Investigator

Leslie A. Hoffman Endowed Research Award

Assessing the Relationship of Cerebral Vascular Reactivity to Outcomes after Aneurysmal Subarachnoid Hemorrhage

Years Inclusive: 2017

% Effort: 10%

Total Direct Costs: \$4500.00

Co-Investigator

PI: Marilyn Hravnak , RN, PhD Institution: University of Pittsburgh School of Nursing

Robert Friedlander, MD Institution: University of Pittsburgh School of Medicine

NIH/NINR

Grant Number: R01 NR 014221

Developing goal directed perfusion therapy in SAH neurocardiac injury

Years Inclusive: 2014-2018

% Effort: 3.75%

Total Direct Costs: \$2,219,027

Co-Investigator

PI: Yvette Conley, PhD, Institution: University of Pittsburgh School of Nursing
NIH/NINR Grant Number: R01 NR013610
Epigenomics of Patient Outcomes after Aneurysmal SAH
Years Inclusive: 2012-2018 % Effort: 5%
Total Direct Costs: \$2,749,754

Pending/Submitted Research

Completed Research

Principle Investigator

Competitive Medical Research Fund Grant Number: NA
The Relationship of Hormone Levels to Outcomes After Acute Aneurysmal Subarachnoid Hemorrhage
Years Inclusive: 7/15/2014- 7/15/2015 % Effort:
Total Direct Costs: \$25,000.00

Project Director

PI: Paula Sherwood, RN, PhD Institution: University of Pittsburgh School of Nursing
Samuel Poloyac, PharmD, PhD Institution: University of Pittsburgh School of Pharmacy
NIH/NINR Grant Number: R01 NR001339-10
Determining genetic and biomarker predictors of DCI and long term outcomes after SAH
Years Inclusive: 2009-2015 % Effort:
Total Direct Costs: \$2,317,267

Principle Investigator

Neuroscience Nursing Foundation Grant Number: NA
The Role of Estrogen in the Development of Delayed Cerebral Ischemia after Aneurysmal Subarachnoid Hemorrhage
Years Inclusive: 2011-2012 % Effort:
Total Direct Costs: \$8385.00

Principle Investigator

Nightingale Scholarship of Pennsylvania Grant Number: NA
The Role of Estrogen in the Development of Delayed Cerebral Ischemia after Aneurysmal Subarachnoid Hemorrhage
Years Inclusive: 2011-2012 % Effort:
Total Direct Costs: \$2000.00

Project Director

PI: Michael Horowitz, MD Institution: University of Pittsburgh Medical Center
NIH/NHLBI Grant Number: R01HL074316
Myocardial Ischemia and Vasospasm in Aneurysmal SAH
Years Inclusive: 2004 - 2011 % Effort:
Total Direct Costs: \$2,134,851

Project Director

PI: Leslie Hoffman, RN, PhD, FAAN: University of Pittsburgh School of Nursing
NIH/NINR Grant Number: R01 NR004339
Role of 20-HETE on vasospasm-induced ischemia after subarachnoid hemorrhage

Years Inclusive: 2005- 2009
Total Direct Costs: \$1,913,826

% Effort:

Project Director

PI: Mary Kerr, RN, PhD, FAAN: University of Pittsburgh School of Nursing
NIH/NINR Grant Number: R01 NR004339
Methods of Detecting Delayed Cerebral Vasospasm after Aneurysmal Subarachnoid Hemorrhage
Years Inclusive: 1999- 2004 % Effort:
Total Direct Costs: \$1,735,886.00

Other Research

Project Director

PI: Paula Sherwood, RN, PhD Institution: University of Pittsburgh School of Nursing
Internal Grant Number: NA
Biological Risk Factors Associated with Cerebral Aneurysms
Years Inclusive: NA % Effort:
Total Direct Costs: NA

Co-Investigator

PI: Tudor Jovin, MD: University of Pittsburgh Medical Center
Internal Grant Number: NA
XeCt Safety Study
Years Inclusive: 2005-2010 % Effort:
Total Direct Costs: NA

Other Scholarly Activities

Grant Reviewer

2010-present Small Grant Reviewer American Association Neuroscience Nursing Foundation
2011-present Grant Reviewer Neuroscience Nursing Foundation (NNF) Grants
2016 Grant Reviewer Leslie Hoffman Scholarship Award University of Pittsburgh School of Nursing

Abstract Reviewer

2010 – present Abstract Reviewer American Heart Association International Stroke Conference
2016 Abstract Reviewer Society of Critical Care Medicine
2017 Abstract Reviewer – International Society of Nursing Genetics

Editorial Review

2006 AACN AANN protocols for practice focusing on the critical neuro population – **“Monitoring Technologies in the Critically Ill Neuroscience Patient”**
2016 Critical Care Medicine **“Core Principles of Acute Neurology: Identifying Neuro Emergencies”**.

Peer Reviewer

2013 - present Journal of NeuroCritical Care
2014 British Journal of Neuroscience Nursing
2017 PIOs One
2017 Neuroscience Nursing

Consultation

2016, July Kazakhstan Professional Development program Module 7: Care of the Hospitalized Patient -Assigned to unit 8 - Care of the patient with altered mental status and Unit 12 - care of the patient with trauma. The modules were formatted to consist of 30 hours of lecture with power points and 30 hours of learning activities to accompany the lectures.

Scholarships and Traineeships

2011 Nightingale Scholarship of Pennsylvania for Doctoral Students, University of Pittsburgh School of Nursing
2011 Ruth Perkins Kuehn Award Sigma Theta Tau Eta Chapter University of Pittsburgh School of Nursing

Presentations

International (see published abstracts for other international presentations)

1. *Nemoto, E., Kerr, M.E. Yonas, H., Kassam, A., Alexander, S., **Crago, E.** (2000, August). *Continuous assessment of cerebrovascular regulation after subarachnoid hemorrhage (SAH) by near-infrared spectroscopy (NIRS)*. Paper presented at the International Society on Oxygen Transport to Tissue, Nijmegen, Netherlands.
2. *Kerr M, Nemoto, E., Yonas H, Kassam, A., **Crago E.** (2000, August). *Vasospasm detection following SAH using cerebral oximetry*. Paper presented at the International Society on Oxygen Transport to Tissue, Nijmegen, Netherlands.
3. ***Crago, E.**, Kerr, M., Kassam, A., Yonas, H. (2001, January). *Clinical presentation of fever, vasospasm and clinical neurologic deterioration following subarachnoid hemorrhage*. Poster presented at the Society of Critical Care Medicine 30th International Educational and Scientific Symposium, San Francisco, Ca.
4. *Lorenzi, L, Kerr, M.E., Yonas, H., Kassam, A., Alexander, S., **Crago, E.** (2001, January). *Delaying treatment after symptoms develop from subarachnoid hemorrhage (SAH) on outcome: A preliminary analysis*. Poster presented at the Society of Critical Care Medicine 30th International Educational and Scientific Symposium, San Francisco, Ca.
5. *Ward, S., Valenta, C., **Crago, E.**, Michalic, D., Mitchell-Perry, R., Reilly, E., Kerr, M.E., Yonas, H. (2001, January). *Implementation and evaluation of a neurologic data set for the SAH patient*. Poster presented at the Society of Critical Care Medicine 30th International Educational and Scientific Symposium, San Francisco, Ca.
6. ***Crago E**, Kerr M, Fails M, Yonas, H. (2002, January). *Effect of preexisting cardiac disease on cardiac complications, angiographic vasospasm and neurological deterioration following subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 31st International Educational & Scientific Symposium, San Diego, CA.
7. *Kerr, M.E., **Crago, E.**, Alexander, S., Kim, Y. Kamboh, I, Marion, D. (2003, January). *Conditions associated with neurologic deterioration in the SAH patient*. Paper presented to the Society of Critical Medicine 32nd International Educational & Scientific Symposium, San Antonio, TX.
8. ***Crago, E.**, Kerr, M.E., Baldesseri, M., Horowitz, M., Kassam, A., Yonas, H. (2003, January). *Impact of cardiac complications on outcomes in patients with subarachnoid hemorrhage*. Paper presented at the Society of Critical Medicine 32nd International Educational & Scientific Symposium, San Antonio, Texas.

9. ***Crago, E.**, Kong, Y., Kerr, M., Yonas, H., Horowitz, M., Kassam, A. (2004, February). *Relationship between aneurysm site and 2 year outcomes in patients following subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 33rd International Educational & Scientific Symposium, Orlando, Florida.
10. *Beatty, M., Kerr, M., Condon, I., Kong, Y., Alexander, S., **Crago, E.**, Horowitz, M., Yonas, H. (2004, January). *Comparison of coiling verses clipping on 6 month outcomes following subarachnoid hemorrhage*. Poster presented at the Society of Critical Care Medicine 33rd International Educational & Scientific Symposium, Orlando, Florida.
11. *Kong, Y., Kerr, M., Crago, E., Yonas, H., (2004, February). *A multifactorial model and Lindegaard ratio for vasospasm prediction following subarachnoid hemorrhage*. Poster presented at the Society of Critical Care Medicine 33rd International Educational & Scientific Symposium, Orlando, Florida.
12. ***Crago E.**, Kerr, M., Levy, E., Horowitz, M., Yonas, H., Kassam A., Stippler, M. (2005, January). *Effect of continuous magnesium infusion on cerebral vasospasm and 3 month outcomes following subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 34th International Educational & Scientific Symposium, Phoenix, AZ.
13. Poloyac, S., **Crago, E.**, Sherwood, P., Bies, R., Hoffman, L.A., Kerr, M.E. (2005). *Temporal profile of 20-HETE, a CYP metabolite of arachidonic acid, in the CSF of subarachnoid hemorrhage patients*. Poster session presented at the International Society for the Study of Xenobiotics, Maui, HI
14. *Hravnak, M., **Crago, E.**, Kong, Y., Hricik, A., Horowitz, M. (2006, January). *Relationship between race, vasospasm and outcomes in african-american and caucasian patients with subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 35th International Educational & Scientific Symposium, San Francisco, CA.
15. ***Crago, E.**, Hravnak, M., Kong, Y., Sherwood, P., Horowitz, M. (2006, January). *Relationship of catecholamines on markers of myocardial ischemia in patients with subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 35th International Educational & Scientific Symposium, San Francisco, CA.
16. *Hravnak, M., **Crago, E.**, Horowitz, M. (2007, February). *Prolonged QT interval after aneurysmal subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 36th International Educational & Scientific Symposium, Orlando, FL.
17. ***Crago, E.**, Gupta, R., Gallek, M., Chang, Y., Horowitz, M., Yonas, H. (2007, February). *Early lower global hemispheric CBF on initial xenon CT in patients with aneurysmal subarachnoid hemorrhage is predictive of poor 3 month outcomes*. Poster presented at the Society of Critical Care Medicine 36th International Educational & Scientific Symposium, Orlando, FL.
18. ***Crago, E.**, Gupta, R., Gallek, M., Chang, Y., Horowitz, M., Yonas, H. (2007, February). *Early lower ipsilateral hemispheric cerebral blood flow on initial Xenon CT is predictive of the development of cerebral vasospasm after subarachnoid hemorrhage*. Poster presented at the Society of Critical Care Medicine 36th International Educational & Scientific Symposium, Orlando, FL.
19. *Gallek, M., Sherwood, P., **Crago, E.**, Alexander, S., Hoffman, L., Horowitz, M., Poloyac, S. (2007, February). *Endothelin-1 cerebrospinal fluid levels are associated with the development of cerebral vasospasm in aneurysmal subarachnoid hemorrhage patients*. Poster presented at the Society of Critical Care Medicine 36th International Educational & Scientific Symposium, Orlando, FL.
20. *Hravnak, M., **Crago, E.**, Miketic, J., Chang, Y., & Horowitz, M. (2008, February). *Admission Serum Glucose and Outcomes in Patients with Subarachnoid Hemorrhage*. Paper presented at the Society of Critical Care Medicine 37th International Educational & Scientific Symposium,

Honolulu, HI.

21. *Sherwood, P., **Crago, E.**, Gallek, M., Hricik, A., Ren, D., Hoffman, L., Poloyac, S. (2008, February). *Endothelin and neuropsychological outcomes in aneurysmal subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 37th International Educational & Scientific Symposium, Honolulu, HI.
22. *Hricik, A.J., **Crago, E.A.**, Bender, C.M., Lu, X., Kassam, A.B., Horowitz, M.B., Hoffman, L.A. (2008, February). *Coiling versus clipping following subarachnoid hemorrhage: 3 & 12 month evaluation of neuropsychological outcomes*. Poster presented at the Society of Critical Care Medicine 37th International Educational & Scientific Symposium, Honolulu, HI.
23. ***Crago, E.**, Sherwood, P., Tanabe, M., Hricik, A., Chang, Y., Hravnak, M., Horowitz, M., Kassam, A., Gorcsan, J., Bender, C. (2008, February). *The relationship between myocardial dysfunction and 12 month neuropsychological outcomes in patients following aneurysmal subarachnoid hemorrhage*. Poster presented at the Society of Critical Care Medicine 37th International Educational & Scientific Symposium, Honolulu, HI.
24. **Crago, E.** (2008, February). *Nursing Year in Review; Rapid Response Teams*. The SCCM 37th International scientific and educational meeting; Honolulu, HI.
25. *Hricik, A.J., Sherwood, P., **Crago, E.**, Hoffman, L., Horowitz, M.B., Bender, C. (2008, February). *Prevalence of cognitive dysfunction 1 year following subarachnoid hemorrhage*. Poster presentation. International Neuropsychological Society 36th Annual Meeting, Waikoloa, Hawaii.
26. Hravnak, M., Frangiskakis, M., **Crago, E.**, Gallek, M.J., Chang, Y., Horowitz, M. (2008). *Elevated cardiac troponinI and electrocardiographic and echocardiographic abnormalities after aneurysmal subarachnoid hemorrhage*. Paper presented at the 21st ESICM Congress, Lisbon, Portugal.
27. ***Crago, E.**, Sherwood, P., Kuo, J., Hricik, A., Horowitz, M., Kassam, A., Poloyac, S. (2009, January). *Cerebrospinal fluid 20-HETE is associated with poor neuropsychological outcomes after aneurysmal subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 38th International Educational & Scientific Symposium, Nashville, TN.
28. *Hravnak, M., **Crago, E.**, Frangiskakis, M., Chang, Y., Gorcsan, J., Horowitz, M. (2009, January). *Relationship between left ventricular motion abnormalities and markers of neurocardiac injury in patients with aneurysmal subarachnoid hemorrhage*. Paper presented at the Society of Critical Care Medicine 38th International Educational & Scientific Symposium, Nashville, TN.
29. **Crago, E.** (2010, January). *Nursing Year in Review*. The 39th SCCM International scientific and educational meeting; Miami, Florida.
30. ***Crago, E.**, Adkins, K., Kuo, C., Horowitz, M., Sherwood, P. (2010, January). *Initial symptom presentation as a predictor of mortality and length of stay in the patient with aneurysmal subarachnoid hemorrhage*. Poster presented at the 39th SCCM International scientific and educational meeting; Miami, FL.
31. *Yousef, K., **Crago, E.**, Kuo, C., Hravnak, M. (2010, January). *Predictors of ventricular ectopy after aneurysmal subarachnoid hemorrhage*. Poster presented at the 39th SCCM International scientific and educational meeting; Miami, FL.
32. *Hravnak, M., Poloyac, S., Yao, J., **Crago, E.**, Chang, Y., Gorcsan, Y., Horowitz, M. (2010, January). *Relationship between catecholamines and neurocardiac injury in patients with aneurysmal subarachnoid hemorrhage*. Poster presented at the 39th SCCM International scientific and educational meeting; Miami, FL.

33. *Alexander, S., Poloyac, S., Ren, D., **Crago, E.**, Conley, Y. (2010, January). *DDAH2 genotype predicts outcome after subarachnoid hemorrhage*. Poster presented at the 39th SCCM International scientific and educational meeting; Miami, FL.
34. *Watkins, L., Alexander, S., Ren, D., **Crago, E.**, Conley, Y., Kagan, V., Bayir, H. (2010, January). *Haptoglobins containing A2 subunit favor angiographic vasospasm in aneurysmal subarachnoid hemorrhage (SAH)*. Poster presented at the 39th SCCM International scientific and educational meeting; Miami, FL.
35. *Kantor, E., Conley, Y., Ren, D., Bayir, H., Provencio, J., **Crago, E.**, Horowitz, M., Alexander, S. (2010, January). *Haptoglobin genotype and functional outcome after subarachnoid hemorrhage*. Poster presented at the 39th SCCM International scientific and educational meeting; Miami, FL.
36. Chuang, P., Donovan, H., Sherwood, P., Hricik, A., **Crago, E.**, Kuo, C.J., Bender, C. (2010, April). *Factors associated with poor neuropsychological outcomes following aneurysmal subarachnoid hemorrhage*. Poster presentation at the Annual Society of Behavioral Medicine Conference, Seattle, WA.
37. ***Crago, E.**, Kuo, C., Sherwood, P., Horowitz, M., Poloyac, S. (2011, January). *Cerebrospinal fluid 20-hydroxyicosatetraenoic acid is associated with delayed cerebral ischemia and poor outcomes after aneurysmal subarachnoid hemorrhage*. Paper presented at the 40th SCCM International scientific and educational meeting; San Diego California.
38. *Yousef, K., **Crago, E.**, Kuo, C., Horowitz, M., Hravnak, M. (2011, January). *Elevated Intracranial Pressure Predicts Poor Function and Death after Subarachnoid Hemorrhage*. Poster presented at the 40th SCCM International scientific and educational meeting; San Diego California.
39. *Hravnak, M., Thampatty, B., Poloyac, S., Yao, J., **Crago, E.**, Horowitz, M. (2011, January). *Persistence of Monoamines in Aneurysmal Subarachnoid Hemorrhage Patients with Myocardial Injury*. Poster presented at the 40th SCCM International scientific and educational meeting; San Diego California.
40. *Watkins, L., Alexander, S., Alexandr, K., Ren, D., **Crago, E.**, Conley, Y., Kaga, V., Bayir, H. (2011, January). *Possible role for haptoglobin and hemoglobin aggregates in pathomechanism of aneurysmal subarachnoid hemorrhage*. Poster presented at the 40th SCCM International scientific and educational meeting; San Diego California.
41. Kim, H., **Crago, E.**, Kim, M., Conley, Y., Sherwood, P., Poloyac, S., Kerr, M. (2011, February). *Genome-wide SNP association for cerebral vasospasm in subarachnoid hemorrhage patients*. Oral presentation at the International Stroke Conference, Los Angeles, CA.
42. *Yousef, K, **Crago, E.**, Hamilton, J., Duursma, M., Colorito, P., Balzer, J., Sherwood, P. (2011, September). *Relationship between mean arterial pressure and cerebral blood flow velocities in patients with subarachnoid hemorrhage*. 9th Annual Neurocritical Care Society Meeting, Montréal, QC, Canada.
43. ***Crago, E.**, Donnelly, M., Sherwood, P., Kuo, C., Balzer, J., Horowitz, M., Poloyac, S. (2011, September). *The association of metabolites of arachidonic acid in CSF on the incidence of delayed cerebral ischemia after aneurysmal subarachnoid hemorrhage*. 9th Annual Neurocritical Care Society Meeting, Montréal, QC, Canada.
44. *Hravnak, M., Thampatty, B., Poloyac, S., Yao, J., **Crago, E.**, Horowitz, M. (2012, October). *Persistently elevated monamines are associated with severity of aneurysmal subarachnoid hemorrhage*. Presented at the European Society of Intensive Care Medicine 24th Annual Conference, Berlin, Germany.

45. *Hravnak M, Thampatty B, Poloyac S, Yao J, **Crago E**, Horowitz M. (2012, February). *Monoamine relationship to blood load following aneurysmal subarachnoid hemorrhage*. Oral Abstract Presentation at the 41st SCCM International Scientific and Educational Meeting; Houston, Texas. (Winner Society of Critical Care Medicine Neurology Award 2012).
46. *Yousef, K., Kuo, C., **Crago, E.**, Balzer, J., Poloyac, S., Sherwood, P. (2012, February). *The Impact of Sodium Level on Neurologic Deterioration after Subarachnoid Hemorrhage*. Poster Presentation at the 41st SCCM International Scientific and Educational Meeting; Houston, Texas.
47. * **Crago E**, Donnelly M, Ren D, Sherwood P, Horowitz M, Poloyac S. (2012, February). *Cerebrospinal fluid 11-12 and 14-15 DHET after aneurysmal subarachnoid hemorrhage*. 41st SCCM International Scientific and Educational Meeting, Houston, Texas.
48. *Thampatty, B., Poloyac, S., Yao, J., **Crago, E.**, Horowitz, M., Hravnak, M. (2012, February). *Endogenous Monoamine Metabolites and Relationship To Gender After Aneurysmal Subarachnoid Hemorrhage*. Poster Presentation at the 41st SCCM International Scientific and Educational Meeting; Houston, Texas.
49. Chuang, P.Y., Hricik, A., Kuo, C.W., **Crago, E.**, Bender, C., Sherwood, P. (2012, February). *Factors associated with poor neuropsychological outcomes following aneurysmal subarachnoid hemorrhage*. Poster presentation at the Society of Critical Care Medicine 41st Critical Care Congress, Houston, TX.
50. *Yousef, K, Choi CJ, **Crago E**, Poloyac S, Balzer J, Sherwood P (2012, October). *Aneurysmal Subarachnoid Hemorrhage: Comparing The Performance of Grading Scales in Predicting Complications and Outcomes*. Poster presentation at the Neurocritical Care Society, Denver, CO. (Distinguished Poster Award)
51. ***Crago, E.**, Sherwood, P., Bender, C., Balzer, G., Ren, D., Poloyac, S. (2012, October). *The Association of Cerebrospinal Fluid Estrogen Levels to Injury and Outcomes After Aneurysmal Subarachnoid Hemorrhage*. Poster presentation at the Neurocritical Care Society, Denver, CO.
52. *Hravnak, M., Chang, Y., **Crago, E.**, Price, T., Horowitz, M. (2013, January). *Impact of Myocardial Injury After Subarachnoid Hemorrhage (Sahmi) Upon Perfusion*. Oral presentation at the Society of Critical Care Medicine 42nd Critical Care Congress, San Juan, Puerto Rico. (Winner Society of Critical Care Medicine Neurology Award, 2013).
53. ***Crago, E.**, Sherwood, P., Bender, C., Balzer, J., Ren, D., Poloyac, S. *The Relationship Between Plasma Estrogen Levels and Severity of Injury and Delayed Cerebral Ischemia After Subarachnoid Hemorrhage*. Poster presentation at the Society of Critical Care Medicine 42nd Critical Care Congress, San Juan, Puerto Rico.
54. *Yousef, K., Balzer, J., **Crago, E.**, Poloyac, S., Sherwood, P. *Transcranial Regional Cerebral Oxygen Desaturation Predicts Delayed Cerebral Ischemia and Poor Outcomes After Subarachnoid Hemorrhage*. Poster presentation at the Society of Critical Care Medicine 42nd Critical Care Congress, San Juan, Puerto Rico.
55. * **Crago E**, Sherwood P, Bender, C, Balzer, J, Ren, D, Poloyac S. (2013, October) Plasma Estrogen Levels Are Associated with Adverse Outcomes Following Acute Aneurysmal Subarachnoid Hemorrhage. Poster presented at the NeuroCritical Care Society, Philadelphia, Pa. (*DISTINGUISHED POSTER*,)
56. *Hravnak M, Chang Y; Price TJ; **Crago E**. Jankowitz B, Friedlander RM.(2013, October) Cerebral perfusion pressure is lower in patients with myocardial injury after subarachnoid hemorrhage. Oral presentation at the European Society of Critical Care Medicine, Paris, France.
57. *Donnelly, M, Conley, Y, **Crago, E**, Sherwood, P,Balzer, J,Poloyac, S. (2014, January). Association of SNPS on Genes Affecting EEt Levels and Delayed Cerebral Ischemia in aSAH

- Patients. Poster presentation at the Society of Critical Care Medicine 43rd Critical Care Congress, San Francisco, Ca.
58. *Hravnak, M., Chang, Y., **Crago, E.** (2015, January). Impact of Age on Perfusion Abnormalities in Patients with Myocardial Injury after Subarachnoid Hemorrhage. Oral presentation at the Society of Critical Care Medicine 44th Critical Care Congress, Phoenix, Az. (Winner Society of Critical Care Medicine Abstract Award, 2015).
 59. ***Crago, E.**, Price, T., Horowitz, M. (2015, January). The Effect of Aneurysmal Subarachnoid Hemorrhage on Work Productivity. Oral presentation at the Society of Critical Care Medicine 44th Critical Care Congress, Phoenix, Az. (Winner Society of Critical Care Medicine Neurology Award, 2015).
 60. *Yousef, K., **Crago, E.**, Price, T., Lagatutta, T., Sherwood, P. (2015, January). Vasopressors Do Not Improve Outcomes of Delayed Cerebral Ischemia After Subarachnoid Hemorrhage. Poster presentation at the Society of Critical Care Medicine 44th Critical Care Congress, Phoenix, Az.
 61. *Stanfill, A., **Crago, E.**, Deslouches, S., & Conley, Y. (2015). Characterization of methylation status for dopaminergic and serotonergic genes in cerebrospinal fluid of subarachnoid hemorrhage patients. Abstract for podium presentation at the International Society of Nurses in Genetics conference, Pittsburgh, PA.
 62. * **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. Oral presentation at the Neurocritical Care Society Meeting, Scottsdale, Az.
 63. *Yousef KM, Lagattuta TF, Chang Y, **Crago E**, Pinsky MR, Hravnak M. (2015, October). The Impact of Norepinephrine Administration on Cerebral and Peripheral Tissue Oxygen Saturation after Subarachnoid Hemorrhage. Poster presentation at the Neurocritical Care Society Meeting, Scottsdale, Az.
 64. ***Crago, E.**, Yousef, K., Chang, Y., Lagatutta, T., Hravnak M. (2016, January). Relationship between cerebral tissue oxygenation and cardiac output after subarachnoid hemorrhage. Poster presentation at the 45th Critical Care Congress, Orlando, Fla.
 65. ***Crago, E.**, Yabes, J., Balzer, J., Triulzi, L, Ducruet, A., Sherwood, P., Poloyac, S. (2016, January). Aneurysmal Subarachnoid Hemorrhage Patients with elevated 20-HETE have higher Lindegaard ratios. Poster presentation at the 45th Critical Care Congress, Orlando, Fla. (Winner Snapshot Abstract Award).
 66. *Hravnak M, Yousef K, Chang Y, **Crago E**, Lagatutta T, Pinsky MR. (2016, January). Noninvasive cardiac output monitoring to evaluate neurocardiac injury after subarachnoid hemorrhage. Poster presentation at the 45th Critical Care Congress, Orlando, Fla.
 67. ***Crago, E.**, Wagner, A., Sherwood, P., Poloyac, S., Conley, Y. (2016, August). The Impact of Aromatase Genotypes on Long Term Outcomes after Aneurysmal Subarachnoid Hemorrhage. Oral Presentation at the International Society of Nurses in Genetics World Conference, Dublin, Ireland.
 68. *Stanfill, A., Sherwood, P., Poloyac, S., **Crago, E.**, & Conley, Y. (2016, August). The impact of dopamine, serotonin, and BDNF genotype on long term outcomes after aneurysmal subarachnoid hemorrhage. Oral presentation at the International Society of Nurses in Genetics world conference, Dublin, Ireland.
 69. Hravnak M, Yousef KM, Chang Y, **Crago E**, Friedlander RM. (2016, October). Cerebral regional tissue oxygenation in patients with neurocardiac injury after subarachnoid hemorrhage. Poster presentation at the European Society of Intensive Care Medicine, Milan, Italy.

70. *Yousef KM, **Crago EA**, Chang Y, Lagattuta TF, Hravnak M. (2017, January). Vasopressors Use in Subarachnoid Hemorrhage: Does it Improve Cerebral Oxygenation? Podium presentation at the 46th Critical Care Congress, Honolulu, HI.
71. *Yousef KM, **Crago EA**, Lagattuta TF, Hravnak M. (2017, January). Admission Predictors of Subarachnoid Hemorrhage-Associated Myocardial Injury. Poster presentation at the 46th Critical Care Congress, Honolulu, HI.
72. ***Crago, E.**, Miller, T., Poloyac, S., Wagner, A. (2017, January). The association between serum insulin growth factor and estrogen to outcomes after aneurysmal subarachnoid hemorrhage. Poster presentation at the 46th Critical Care Congress, Honolulu, HI.
73. *Yousef KM, Kagiyaami N, **Crago E**, Lagattuta T, Mahmoud K, Friedlander RM, Gorcsan J, Hravnak M. (2017, October). Modest Elevation in Troponin Predicts Functional Myocardial Impairment by Echocardiogram After Aneurysmal Subarachnoid Hemorrhage. Oral presentation at the European Society of Intensive Care Medicine, Vienna, Austria.
74. Heinsberg L, Ren D, **Crago E**, Sherwood P, Poloyac S, Conley Y. HAMP Gene Polymorphism and Patient Outcomes Following Aneurysmal subarachnoid Hemorrhage. Poster presentation at the International Society of Nurses in Genetics World Conference, Reston, Virginia.
75. ***Crago E**, Kagiyaami 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. Poster presentation at the 15th Neurocritical Care Society Meeting Waikoloa, Hawaii.
76. ***Crago E**, Miller T, Poloyac S, Park S, Wagner A. Plasma Insulin Growth Factor Levels are Associated with Clinical Severity and Outcomes after Aneurysmal SAH. Poster presentation at the 15th Neurocritical Care Society Meeting Waikoloa, Hawaii.
77. Hravnak M, Yousef KM, Kagiyaami N, Sugahara M, **Crago E**, Mahmoud K, Lagattuta T, Gorcsan J. Persistent Global Longitudinal Strain Abnormality By Echocardiogram Predicted by Cardiac Troponin I. Podium presentation at the 47th Critical Care Congress, San Antonio, Tx. (STAR Abstract Award).
78. **Crago E**, Kagiyaami 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. Poster presentation at the 47th Critical Care Congress, San Antonio, TX.
79. **Crago E**, Kagiyaami 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. Podium presentation at the 47th Critical Care Congress, San Antonio, Tx. (STAR Abstract Award).

National

1. ***Crago, E.**, Kerr, M., Fails, M., Yonas, H. (2002, October). *Effect of Preexisting Cardiac disease on cardiac complications, angiographic vasospasm and neurological deterioration*

- following subarachnoid hemorrhage.* Paper presented at the State of the Science, Washington, D.C.
2. *Tanabe, M., Horowitz, M.B., Cannesson, M., Hravnak, M., Crago, E.A., Gorcsan, J. (2006, March). *The relationship between regional left ventricular wall motion and troponin_I levels in patients with subarachnoid hemorrhage: Results of the SAHMII study.* Presented at the American Association of Cardiologists 55th Annual Meeting, Atlanta, GA.
 3. *Bender, C., Sherwood, P., Hricik, A., **Crago, E.**, Hoffman, L. (2006, April). *Neuropsychological sequelae following aneurysmal subarachnoid hemorrhage.* Oral presentation at the American Association of Neuroscience Nurses 38th Annual Meeting, San Diego, CA.
 4. * Hravnak, M., **Crago, E.**, Kong, Y., & Horowitz, M.B. (2006, April). *Prevalence of electrocardiographic abnormalities in patients with subarachnoid hemorrhage.* Accepted for oral presentation American Association of Critical Care Nurses National Teaching Institute. (Winner of an AACN Research Abstract Award 2006).
 5. *Tanabe, M., **Crago, E.A.**, Hravnak, M., Horowitz, M.B., Gorcsan, J. (2007, March). *Relationship of mild troponin-I elevations to cardiac function and pulmonary congestion in patients with subarachnoid hemorrhage: Results of the SAHMII study.* Presented at the American Association of Cardiologists 56th Annual Meeting, New Orleans, LA.
 6. *Tanabe, M., Crago, E.A., Hravnak, M., Horowitz, M.B., Gorcsan, J. (2007, March). *Relationship of acute cardiac dysfunction with clinical severity of subarachnoid hemorrhage: Results of the SAHMII study.* Presented at the American Association of Cardiologists 56th Annual Meeting, New Orleans, LA.
 7. ***Crago, E.**, Hravnak, M., Kong, Y., Sherwood, P., Horowitz, M. (2006, April). *Relationship of catecholamines on markers of myocardial ischemia and outcomes in patients with subarachnoid hemorrhage.* Paper presented at the American Association of Neuroscience Nurses 38th Annual Conference, San Diego, California.
 8. *Hravnak, M., **Crago, E.**, Hricik, A., & Horowitz, M.B. (2007, May) *Relationship between serum glucose and outcomes in patients with subarachnoid hemorrhage.* Paper presented at the AACN National Teaching Institute, Atlanta, Georgia. (AACN Research Abstract Award Winner 2007).
 9. *Sherwood, P., **Crago, E.**, Poloyac, S., Bies, R., Hoffman, L., Gallek, M., Kerr, M. (2006, October). Mechanisms involved in cerebral vasospasm following aneurysmal subarachnoid hemorrhage. Paper presented at the National Congress on the State of the Science Nursing Research Conference, Washington, D.C.
 10. ***Crago, E.**, Hravnak, M., Kong, Y., Sherwood, P., & Horowitz, M. (2006, October). *Relationship of catecholamines on markers of myocardial ischemia in patients with subarachnoid hemorrhage.* Paper presented at the National Congress on the State of the Science Nursing Research Conference, Washington, D.C.
 11. *Frangiskakis JM, Tanabe M, Hravnak M, **Crago E.A.**, Gorcsan J, Horowitz MB, London, B. (2007). *B-adrenergic receptor polymorphism predicts ventricular arrhythmia after subarachnoid hemorrhage.* Presented to the Heart Rhythm Society, Denver, CO.
 12. *Frangiskakis, J.M., Tanabe, M., Hravnak, M., **Crago, E.A.**, Gorcsan, J., Horowitz, M.B., London, B. (2007, November). *The MinK G38S polymorphism associates with atrial arrhythmias after subarachnoid hemorrhage.* American Heart Association Scientific Session, Orlando, FL.
 13. ***Crago, E.**, Thomas, A., Gallek, M., Hricik, A., Horowitz, M. (2008, March). *Combined neuroform stenting and coil embolization of acutely ruptured aneurysms: Report of 41.* Paper

- presented at the American Association of Neuroscience Nurses, 40th Annual Educational Meeting, Nashville, TN.
14. *Sherwood, P., Kassam, A., Hricik, A., Mintz, A., **Crago, E.**, Donovan, H. (2008, March). *Patient outcomes following endoscopic endonasal approach for tumor removal*. Paper presented at the American Association of Neuroscience Nurses, 40th Annual Educational Meeting, Nashville, TN.
 15. *Stippler, M., **Crago, E.**, Levy, E.I., Horowitz, M.B., Kassam, A. (2008, April). *Effect of Continuous Magnesium Infusion on Cerebrospinal Fluid Magnesium Concentration after Aneurysmal Subarachnoid Hemorrhage*. The 76th Annual American Association of Neurological Surgeons. Chicago, Ill.
 16. ***Crago, E.**, Sherwood, P., Tanabe, M., Kricik, A., Chang, Y., Hravnak, M., Horowitz, H., Kassam, A., Gorcsan, J., Bender, C. (2008, October). *The relationship between myocardial dysfunction and 12 month neuropsychological outcomes in patients following aneurysmal subarachnoid hemorrhage*. Oral presentation at the National State of the Science Congress on Nursing Research Council for the Advancement of Nursing Science, Washington, D.C.
 17. *Hricik, A. J., Sherwood, P., **Crago, E.**, Hoffman, L., Horowitz, M.B., Bender, C. (2008, October). *Prevalence of cognitive dysfunction 1 year following subarachnoid hemorrhage*. Oral presentation at the National State of the Science Congress on Nursing Researching Council for the Advancement of Nursing Science, Washington, D.C.
 18. *Sherwood, P., Kassam, A., Hricik, A., Mintz, A., **Crago, E.**, Donovan, H. (2008, October). *Patient outcomes following endoscopic endonasal approach for tumor removal*. Oral presentation at the National State of the Science Congress on Nursing Research Council for the Advancement of Nursing Science, Washington, D.C.
 19. Newberry, A., Sherwood, P., Hricik, A., Bradley, S., **Crago, E.**, Hoffman, L. (2008, October). *Recruitment and Retention in Neurological Research: Strategies to Improve Success*. Oral Presentation at the National State of the Science Congress on Nursing Research Council for the Advancement of Nursing Science. Washington, D.C.
 20. *Miketic, J., Hravnak, M., Horowitz, M., **Crago, E.** (2009, May). *Impact of Myocardial Injury in Patients after Subarachnoid Hemorrhage*. Presented at American Association of Critical Care Nurses National Teaching Institute, New Orleans, La.
 21. *Donnelly, M., **Crago, E.**, Sherwood, P., Horowitz, M., Conley, Y., Hricik, A., Kuo, C., Kassam, A., Poloyac, S. (2009, March). *CYP4F2 polymorphic variants are linked to 20-HETE CSF levels and neuropsychological outcomes in aSAH patients*. 11th International Winter Eicosanoid Conference; Baltimore, MD.
 22. *Donnelly M, **Crago E**, Sherwood P, Horowitz M, Hricik A, Kuo J, Poloyac S. (2009, March). *20-HETE CSF levels are linked to neuropsychological outcomes in aSAH patients*. The 11th International Winter Eicosanoid conference; Baltimore, MD.
 23. *Quolke, V., Bender, C., Kuo, C., **Crago, E.**, Poloyac, S., Sherwood, P. (2010, October). *Objective versus subjective measures of cognitive function following aneurysmal subarachnoid hemorrhage*. Presented at the National Nursing State of the Science Meeting, Washington, D.C.
 24. *Knisely, D., Kuo, C., Quolke, V., **Crago, E.**, Connely, Y., Poloyac, S., Sherwood, P. (2011, March). *Serotonin transporter gene polymorphisms (5-HTTLPR and 5HTTVNTR) and APOE as genetic markers of depression following aneurysmal subarachnoid hemorrhage*. Presented at the National Undergraduate Research Meeting, Ithaca College, New York.
 25. *Donnelly, M., **Crago, E.**, Sherwood, P., Poloyac, S. (2011, October). *Cytochrome P450 eicosanoid levels in cerebrospinal fluid and delayed cerebral ischemia in subarachnoid*

hemorrhage. Oral presentation at the American College of Clinical Pharmacology, Annual Meeting, Pittsburgh, PA.

26. Qi Z, Sugahara M, **Crago EA**, Chang YF, Lagattuta TF, Yousef K, Friedlander RM, Hravnak MT, Gorcsan J 3rd. (2016, Apr). Association of global Longitudinal strain with severity of neurocardiac injury in patients with subarachnoid hemorrhage. Poster presentation at the American College of Cardiology National Meeting 2016, Orlando, Fla.
27. Qi Z, Sugahara M, **Crago EA**, Chang YF, Lagattuta TF, Yousef K, Friedlander RM, Hravnak MT, Gorcsan J 3rd. (2016, Apr). Neurocardiac injury in patients with subarachnoid hemorrhage is associated with regional left ventricular discoordination. Poster presentation at the American College of Cardiology National Meeting 2016, Orlando, Fla.
28. Qi Z, Sugahara M, **Crago EA**, Chang YF, Lagattuta TF, Yousef K, Friedlander RM, Hravnak MT, Gorcsan J 3rd. (2016, June). Changes in echocardiographic global longitudinal strain are associated with neurocardiac injury in patients with subarachnoid hemorrhage. Poster presentation at the American Society of Echo cardiologists, Seattle, Washington.
29. Qi Z, Sugahara M, **Crago EA**, Chang YF, Lagattuta TF, Yousef K, Friedlander RM, Hravnak MT, Gorcsan J 3rd. (2016, June). Dispersion of left ventricular segmental peak longitudinal strain as a new marker of neurocardiac injury in patients with subarachnoid hemorrhage. Poster presented at the American Society of Echo cardiologists, Seattle, Washington.
30. * Kagiya N, Sugahara M, **Crago EA**, Lagattuta TF, Yousef KM, Hravnak MT, Gorcsan J. Right ventricular strain as a new marker of neuro-cardiac injury in patients with subarachnoid hemorrhage. Poster presented American Society of Echocardiography National Meeting 2017.
31. * Kagiya N, Sugahara M, **Crago EA**, Lagattuta TF, Yousef KM, Hravnak MT, Gorcsan J. Reduced global longitudinal strain is associated with in-hospital mortality in patients with subarachnoid hemorrhage and preserved ejection fraction. Poster presented American Society of Echocardiography National Meeting 2017.
32. *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 on in neurocardiac injury assessed by strain imaging is associated with in hospital mortality in subarachnoid hemorrhage. Oral presentation at the American Heart Association National Meeting 2017.
33. *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. Poster presentation at the American Heart Association National Meeting 2017.

Regional

1. *Kerr, M., Nemoto, E., Yonas, H., Kassam, A., **Crago, E.** (2001, March). *Vasospasm detection following SAH using cerebral oximetry*. Paper presented at the Eastern Nursing Research Society 13th Annual Scientific Sessions, Atlantic City, NJ.
2. ***Crago, E.**, Kerr, M., Kassam, A., Yonas, H. (2001, March). *Clinical presentation of fever, vasospasm and clinical neurologic deterioration following subarachnoid hemorrhage*. Paper presented at the Eastern Nursing Research Society 13th Annual Scientific Sessions, Atlantic City, NJ.
3. ***Crago, E.**, Kerr, M., Fails, M., Yonas, H. (2002, March). *Effect of preexisting cardiac disease on cardiac complications, angiographic vasospasm and neurological deterioration following*

- subarachnoid hemorrhage*. Paper presented at the Eastern Nursing Research Society 14th Annual Scientific Sessions, University Park - Penn State University, PA.
4. Kerr, M., **Crago, E.**, Yonas, H. (2002, March). *Standardizing criteria for measuring vasospasm, neurological deterioration and ischemia following subarachnoid hemorrhage*. Paper presented at the Eastern Nursing Research Society 14th Annual Scientific Sessions, University Park - Penn State University, PA.
 5. ***Crago E**, Kerr M, Fails M, Yonas H. (2002, March). *Effect of preexisting cardiac disease on cardiac complications, angiographic vasospasm and neurological deterioration following subarachnoid hemorrhage*. Poster session presented at the Eastern Nursing Research Society 14th Annual Scientific Sessions, Penn State University, PA.
 6. ***Crago, E.**, Kerr, M.E., Baldesseri, M., Horowitz, M., Kassam, A., Yonas, H. (2003, March). *Impact of cardiac complications on outcomes in patients with subarachnoid hemorrhage*. Paper presented at the Eastern Nursing Research Society 15th Annual Scientific Sessions, New Haven, CT.
 7. ***Crago, E.**, Kong, Y., Kerr, M., Yonas, H., Horowitz, M., Kassam, A. (2004, March). *Relationship between aneurysm site and 2 year outcomes in patients following subarachnoid hemorrhage*. Paper presented at the Eastern Nursing Research Society 16th Annual Scientific Symposium, Boston, MA.
 8. ***Crago, E.**, Kong, Y., Kerr, M., Yonas, H., Horowitz, M., Kassam, A. (2004, March). *Relationship between aneurysm site and 2 year outcomes in patients following subarachnoid hemorrhage*. Poster session presented at the National Congress for the State of the Science in Nursing, Washington, D.C.
 9. ***Crago E.**, Kerr, M., Levy, E., Horowitz, M., Yonas, H., Kassam A., Stippler M. (2005, March). *Effect of continuous magnesium infusion on cerebral vasospasm and 3 month outcomes following subarachnoid hemorrhage*. Paper presented at the Eastern Nursing Research Society 17th Annual Scientific Symposium, New York, NY.
 10. *Kong, Y., Kerr, M., **Crago, E.**, (2005, March). *Temperature changes by treatment groups after aneurysmal subarachnoid hemorrhage (SAH)*. Poster session presented at the Eastern Nursing Research Society 17th Annual Scientific Sessions, New York, NY.
 11. Newberry, A., Sherwood, P., Hricik, A., Bradley, S., **Crago, E.**, Hoffman, L. (2008, October). *Recruitment and retention in neurological research: Strategies to improve success*. Oral presentation at the Greater Pittsburgh Nursing Research Conference, Pittsburgh, PA.

Local

1. *Lorenzi, L., Kerr, M.E., Yonas, H., Kassam, A., Alexander, S., **Crago, E.** (2000). Influence of delaying treatment after symptoms develop from subarachnoid hemorrhage (SAH) on outcome: A preliminary analysis. Paper presented at the Greater Pittsburgh 12th Annual Nursing Research Conference, Pittsburgh, PA.
2. ***Crago, E.**, Kerr, M., Fails, M., Yonas, H. (2002). Effect of preexisting cardiac disease on cardiac complications, angiographic vasospasm and neurological deterioration following subarachnoid hemorrhage. Poster session presented at the 3rd Annual Clinical and Research Poster Session Sponsored by Sigma Theta Tau Eta Chapter, University of Pittsburgh School of Nursing, Pittsburgh, PA.
3. Poloyac, S., Kohanic, P., **Crago, E.**, Sherwood, P. (2007, July). *Using interdisciplinary teams in research*. Clinical and Translational Science Institute (T32) Summer Internship Program, University of Pittsburgh, Pittsburgh, PA.

4. **Crago, E.**, (2012, February). *What is research and why do we do it*. Pittsburgh Aneurysm Support group, Pittsburgh, PA.
5. **Crago, E.**, (2012, March). *Vascular Stability after Neurological Insult*. 7th Annual Acute Stroke Management Conference, Pittsburgh, PA.
6. **Crago, E.**, (2013, February). *Transcranial Dopplers after Aneurysmal Subarachnoid Hemorrhage*. Pittsburgh Aneurysm Support group, Pittsburgh, PA.
7. **Crago, E.**, (2015, September). *Optimizing Hemodynamics and Perfusion after Stroke*. 1st Annual Excelsa Health Evidence Based Practice Symposium, Greensburg, PA.

Teaching

Primary Teacher

Term/Years	Course Number & Title	No. of Students	Level	Topic of Lecture
2016 – current (3 terms/yr)	NUR 1121 Advanced Clinical Decision Making	28-76	Senior BSN	Didactic
2016	NUR 1121c	8	Senior BSN	Clinical Rotation- Emergency Department
2013	NUR 3030 Research Development (co-taught)	5	PhD-DNP	Didactic

Lecturer/Guest Lecturer

Term/Years	Course Number & Title	No. of Students	Level	Topic of Lecture
2006-2015	CNS Role Class	~7	MSN- DNP	Overview of the role of CNS as a Researcher
2007-present	NURNP 2105&2106 Critical Care & Cardiopulmonary Clinical Emphasis	~10-20	ACNP- DNP	Intracranial Hemorrhage, Subarachnoid Hemorrhage & Other Life Threatening Headaches
2010	NUR 2000 Research for Evidence Based Practice I	~56	Graduate	Examines the interaction of theory, research, and clinical expertise in the development of evidence based nursing practice
2013	NUR 2031 Diagnostic Physical Exam Across the Lifespan	~67	Graduate	Competency testing for Physical Exam
2014	NUR 3030	4	PhD	Pros and Cons of K99 application
2016	NUR 2171	80	Graduate	Graduate Pathology Neurologic structure function and disorders

Other Mentoring Activities

	Dissertation Committees	Role	Title
2016-present	Lacey Wright Heinsberg	Committee Member, PhD	Multi-omics of the Iron Homeostasis Pathway in Patient Outcomes Following aSAH
2017-present	Lingjue Li	Committee Member, PhD	Alterations of Cerebral Blood Flow after Neurovascular Diseases
2017-present	Charles Warner	Committee Member, DNP	Standardized Labeling of Continuous Infusions to Reduce Errors in the Critical Care Transport Setting

Research Practicum Students

2002	John RN BSN	Graduate student	Class project and presentation
2002	Ian Condon	Undergraduate student	Class project and presentation
2003	Michelle Fails RN, BSN	Graduate student	Class project and presentation
2004	Ray Pentz, RN, BSN	Graduate student	Class project and presentation
2005	Melissa Fike RN BSN	Graduate student	Class project and presentation
2005	Jeanie Miller, RN, BSN	Graduate student	Class project and presentation
2006	Michelle Kaus, RN, BSN	Graduate student	Class project and presentation
2007	Lauren Korn-Naveh RN BSN	Graduate student	Published Manuscript Journal of Neuroscience Nursing
2007	Jason Hamilton RN BSN	Graduate student	Published Manuscript Journal of Neuroscience Nursing
2008	Heather Butler RN BSN	Graduate student	Class project and presentation
2008	Kristen Svardi RN BSN	Graduate student	Class project and presentation
2008	April Brewster RN BSN	Graduate student	Class project and presentation
2008	Lauren Rissman	Undergraduate student	Manuscript development
2009	Lisa Matelan	Graduate student	Class project and presentation
2009	Kristin Adkins	Graduate student	Published Manuscript Journal of Emergency Nursing, Class project and presentation
2009	Kelly Kerris	Graduate student	Manuscript American Journal of Critical Care, Class project and presentation
2010	Nicole Roselli	Undergraduate student	Manuscript development
2010	Jason Hamilton	Graduate Student	Manuscript development
2012	Thomas Price	Undergraduate student	Manuscript development
2013	Thomas Horsfall	Undergraduate student	Clinical Neuroscience and Research, Abstract development
2015-2016	Amber McAteer	Honors Undergraduate	Committee Member; Honors Thesis and Defense, Manuscript. Graduate 4/2016 Manuscript published Journal of Biologic Nursing The Relationship Between BNP, Neurocardiac Injury Severity, Noninvasive Cardiac Output, and Outcomes After Aneurysmal Subarachnoid Hemorrhage

2014- 2016	Eleanor Turi	URMP and Honors Undergraduate	Committee Member; Honors Thesis and Defense Manuscript Graduate 12/2016 Psychosocial Co-morbidities Related to Return to Work Following Aneurysmal Subarachnoid Hemorrhage
2015- present	Allison O’Handley	URMP	data collection, data entry, abstract and manuscript development
2015- present	Emma Slas	URMP	data collection, data entry, abstract and manuscript development
2017	Grace Mallampalli	Undergraduate student	Research practicum
2017	Lacey Wright Heinsburg RN	Doctoral Student (Nursing)	Committee Member
2017	Lingjue Li PharmD	Doctoral Student (Pharmacy)	Committee Member
2017	Charles Warner RN	ACNP DNP Student	Committee Member

Service

**University of Pittsburgh
School of Nursing**

2008- 2014 CPR Instruction
2017 Faculty Practice Committee

Community

1990-2010 Yearly lecture for the Pennsylvania State Police Camp Cadet on TBI,
drinking and driving
1990- 2010 Guest lecturer at various schools and community groups on trauma and
drunk driving
1990-present Yearly Paramedic Instruction at Mutual Aid Ambulance Service,
Greensburg, Pa: Neurological Emergencies, Toxicology, Hematology,
Immunology, Endocrinology, ACLS and PALS
2001-2010 Hempfield School District health fairs and job fairs
2001-present Community CPR and First Aid Instructor
2007-present Participate in Annual Comcast Cares activities in local community
2012-present Parish nurse CUMC Youngwood (appointed - not certified)
2015-present Westmoreland County Food Bank Volunteer

Professional

2013- current Research Section member Society of Critical Care Medicine
2013- current Neuroscience Section member Society of Critical Care Medicine
2013-2016 Research Committee – Society of Critical Care Medicine
2012-2013 Guest speaker Aneurysm support group, Pittsburgh Pa
2009-2011 Research Chair – Nursing Section Society of Critical Care Medicine
2000-present Research Committee Nursing Section
2010-2013 Abstract Reviewer International Stroke Conference; American Heart
Association
2010-present Grant reviewer Neuroscience Nursing Foundation

2017
2018

Abstract reviewer ISONG
Patient and Family Centered Care Committee Society of Critical Care
Medicine