“The principal goals of research and education are to create people who are capable of doing new things, not simply of repeating what other generations have done—people who are creative, inventive and discoverers.”

JEAN PIAGET
ACCENDMENT OF KNOWLEDGE is a strategic goal that is woven throughout the fabric of Baystate Medical Center. Academic Week celebrates the accomplishments of our residents, fellows, faculty, coordinators, nurses, allied health professionals and others who are involved in biomedical and educational research.

BMC's Academic Week is Monday May 14, 2012 through Friday May 18, 2012. The collection of work accomplished by our residents, fellows, faculty, coordinators, nurses, allied health professionals and others will be highlighted throughout the week at the various activities taking place in the Chestnut Conference Center. Please review the daily schedule and visit, learn and recognize the breadth of scholarly contributions our residents, fellows, faculty, coordinators, nurses, allied health professionals and others have made to the field of medicine.

ACADEMIC WEEK HIGHLIGHTS

MONDAY - MAY 14, 2012
Academic Week Kick-Off Gala
Reception and Poster Display
4:00–6:00 p.m. Chestnut 2
Presentation - Peter Lindanauer, MD
6:00–7:00 p.m. Chestnut 1

TUESDAY - MAY 15, 2012
Key Note Speaker
Lynda Juall Carpentino-Moyet, RN, MSN, CRNP
2:00–3:00 p.m. Chestnut 1

WEDNESDAY - MAY 16, 2012
Key Note Speaker
Susan Swing, PhD
12:00–1:00 p.m. Chestnut 1

THURSDAY - MAY 17, 2012
Allied Health Education Career Fair
5:30–7:30 p.m. Chestnut 3,4,5

FRIDAY - MAY 18, 2012
Academic Week Award Ceremony and Presentations
12:00–1:00 p.m. Chestnut 1

Keynote Speakers

Lynda Juall Carpentino-Moyet, RN, MSN, CRNP
Lynda Juall Carpentino-Moyet graduated with a BSN from Seton Hall University, a MSN from the University of PA, and a Post-Master’s Family Nurse Practitioner Certificate from Thomas Jefferson University in Philadelphia, PA. She has authored four books on Nursing Diagnosis and Care Planning, one book on Clinical Teaching and co-authored Bedside Assessment and Nursing Diagnosis (published in English for Japanese medical and nursing students). Her books have been translated into 13 languages. She also lectures at health care institutions and nursing programs throughout the US and internationally. She practices at ChesPenn Health Services in Chester, PA, which is a Federally Qualified Health Center, as a Family Nurse Practitioner. In her other life, she is Ona to her two grandsons and designs and makes jewelry.

Susan Swing, PhD
Dr. Swing is vice president of outcome assessment at the ACGME. For the past several years her work has focused on development and implementation of the ACGME Outcome Project. Currently, she oversees all milestone development and participates on several milestone specialty groups and the Expert Panel as the ACGME staff director. Dr. Swing also directs the ACGME’s assessment group in its efforts to develop assessment processes for use in measuring resident performance against milestones. Previously, as director of the Outcome Project, she worked with advisory groups to develop the general competencies, an overall model assessment system, implementation plan and processes, and most recently standards for evaluating assessment tools. Dr. Swing is a co-developer of the ACGME/ABMS Toolbox of Assessment Methods and author of several articles on the Outcome Project. Dr. Swing received her PhD from the University of Wisconsin-Madison in educational psychology where her major areas of study were cognition, learning, and instruction; statistics; and research methods. Her early career years were spent as a teacher educator and educational researcher at Northwestern University’s School of Education and Social Policy.

All sessions welcome audiences of all professions and backgrounds.
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<td>“Evidence Based Practice: From Problem Identification to Practice Change to Publication”</td>
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<td>Anita Sarro, RN, MSN, JD</td>
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<td>Susan Swing, PhD &amp; Lauri Meade, MD “Milestones: Theory to Practice”</td>
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<td>Karen Christianson, RN, CCRP &amp; Glenn Markenson, MD “IRB 101: Keys to Success”</td>
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<td>Barbara Richard, MA “How to Conduct Sponsored Research at Baystate”</td>
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MONDAY, 5/14/2012

**Peter K. Lindenauer, MD, MSc, FACP**, is Director of the Center for Quality of Care Research at Baystate Medical Center, Medical Director of Clinical Decision Support for Baystate Health, and Associate Professor of Medicine at the Tufts University School of Medicine. A board-certified internist and founding Board member of the Society of Hospital Medicine, Dr. Lindenauer’s research focuses on measuring the quality and outcomes of hospital care for patients with common medical conditions, evaluating the effectiveness and comparative effectiveness of acute treatments and care strategies, and the design and evaluation of interventions to improve care delivery. He is currently supported by grants from the Agency for Healthcare Research and Quality and the National Heart Lung and Blood Institute of the NIH. His research has appeared in the New England Journal of Medicine, JAMA, Annals of Internal Medicine, Health Affairs, Medical Care, and leading general internal medicine and subspecialty journals. In 2008 he received the excellence in research award from the Society of Hospital Medicine. He is a member of the Editorial Boards of the Journal of Hospital Medicine, the Joint Commission Journal of Quality and Patient Safety, and Perioperative Medicine.

TUESDAY, 5/15/2012

**Lynda Juall Carpenito Moyet, RN, MSN, CRNP** graduated with a BSN from Seton Hall University, a MSN from the University of PA, and a Post-Master’s Family Nurse Practitioner Certificate from Thomas Jefferson University in Philadelphia, PA. She has authored four books on Nursing Diagnosis and Care Planning, one book on Clinical Teaching and co-authored Bedside Assessment and Nursing Diagnosis (published in English for Japanese medical and nursing students). Her books have been translated into 13 languages. She also lectures at health care institutions and nursing programs throughout the US and internationally. She practices at ChesPenn Health Services in Chester, PA, which is a Federally Qualified Health Center, as a Family Nurse Practitioner. In her other life, she is Ona to her two grandsons and designs and makes jewelry.

**Paula Lusardi, RN, PhD** is the former Critical Care Clinical Nurse Specialist in the Intensive Care Unit (ICU) and is presently the Director of Nursing Research at Baystate Medical Center in Springfield, Massachusetts. She has held a variety of positions in critical care and academia. Her greatest joy lies in working with dedicated bedside nurses and supporting their efforts to provide superb patient care, care based in the best and most current evidence. Her research, writing and teaching is focused on collaborative clinical and research supports, processes to achieve evidence-based nursing practice, and achieving practice change through mentoring staff nurses. Paula obtained a Bachelor of Science degree from Skidmore College in Saratoga Springs, NY, a Masters of Science degree from Boston University, and a PhD in nursing theory and research from the University of Rhode Island. She is active in a variety of nursing organizations, especially AACN. She lives with her husband, a professor of law, in Longmeadow, Massachusetts. They have four children. Paula enjoys traveling with her husband and children, camping, skiing, and reading.

**Melany Wheeler, RN** is a strong advocate for Nursing Self-Care. Her presentation Building Resilience in the Face of Moral Distress brings awareness to an aspect of nursing much in need of support. She is a ten year veteran of Baystate Hospital’s Neonatal Intensive Care Unit and a 2010 recipient of Baystate Hospital’s Clinical Excellence in Nursing Award. She came to Baystate Hospital in 2002, bringing with her experience working in acute care psychiatry and adult medical/surgical nursing. Melany received her nursing education at Holyoke Community College.
**WEDNESDAY, 5/16/2012**

**Rebecca Blanchard, PhD,** is Assistant Professor of Education Research in Academic Affairs and an Assistant Professor of Medicine with Tufts University School of Medicine. Dr. Blanchard received her PhD in education research and statistics and specializes in cultivating collaborative and innovative educational projects. Dr. Blanchard’s ongoing research contributes to Baystate’s mission of providing quality patient care and promotes Baystate as a leader in medical education. While Dr. Blanchard works to improve many aspects of the teaching and learning at Baystate, much of her focus is on individual and program evaluation. Most recently, in collaboration with Dr. Gladys Fernandez (Surgery) and Dr. Andrew Doben (Surgery), Dr. Blanchard was awarded the Norman S. Stearns Grant for Ethics and Professionalism for the project, “Evaluating Residents’ Ethical Responses during Simulated High-Stakes, Time-Sensitive Patient Care Events.”

**Ellen Brassil, MSLIS, AHIP,** has been Health Sciences Library Director at Baystate since 2010. Ellen is a Distinguished Member of the Academy of Health Information Professionals and has been active for many years in regional and national library organizations, such as the Medical Library Association, where she has also developed and taught CE courses in the past. She is a graduate of Drew University and has a Masters in Library and Information Science from Simmons College in Boston. Ellen has been Book Review Column Editor for the *Journal of Electronic Resources in Medical Libraries* and currently edits the Book Review Column for *Medical Reference Services Quarterly*. She is currently on the Editorial Board of the Journal of the Medical Library Association. She has taught online information literacy credit courses to undergraduate nursing students and is completing a Masters in Teaching.

**Karen Christianson, RN, CCRP,** is the Director of the Baystate Health Human Research Protection Program (HRPP). Her responsibilities include direct oversight for the Institutional Review Boards, the internal monitoring program, community outreach, and educational programming for human subjects researchers as well as coordination with the other components of the institution essential to the successful and proper conduct of human subjects research. Under Ms. Christianson’s leadership, Baystate was granted full accreditation by the Association for the Accreditation of Human Research Accreditation Programs (AAHRPP) in 2010. Ms. Christianson has since functioned as a site visitor for AAHRPP, as a consultant to other institutions, and as a judge for the annual human research protections awards presented by the Health Improvement Institute. In 2011, Ms. Christianson, and the Baystate HRPP, were awarded IRBNet’s “Ethics in Human Research Protections” award.

**Joanna Donahue, RN, MBA,** has been the Director of Continuing Education for Baystate Health since 1987. After completing an undergraduate and graduate degree at University of Massachusetts, she became Associate Director of Career Development at Smith College where she provided career counseling to Smith undergraduates and Alumnae.

**Steven Dunn, MD,** is a Professor of Anesthesiology and is the Program Director for the Anesthesiology residency here at Baystate. He did his anesthesiology residency at the Brigham and Women’s Hospital in Boston followed by fellowships in Obstetrical Anesthesiology and Pediatric Anesthesiology. He has lectured nationally and internationally for many years.
Loretta Grikis, MLS, is the Reference and Instruction Librarian for the Health Sciences Library. In this role, she performs well over 500 medical literature searches for Baystate clinicians every year, and provides database searching instruction on-demand and in classrooms settings on a daily basis all over the Health System. Since receiving her Master’s Degree in Library Science in 1983, she has worked in large public library systems in Connecticut and New York, including the New York Public Library, as well as in hospital libraries.

Carolanne Lovewell, RLATG, CPIA, BACF, is the Director of the Baystate Animal Care Facility. Carol is a member of the Institutional Animal Care and Use Committee (IACUC) and the Institutional Biosafety Committee (IBC). Carol is the Institutional Education Coordinator. Carol has over 30 years experience working with many different species of companion and laboratory animals. In her spare time she enjoys spending time working with her husband and animals at home on her hobby farm. Carol raises egg laying hens and meat chickens. She also breeds French Alpine goats and Champion Labrador Retrievers.

Glenn Markenson, MD, is the Director of Maternal Fetal Medicine and Medical Director of the Human Research Protection Program at Baystate Medical Center in Springfield. He completed his residency in Obstetrics and Gynecology at Tripler Army Medical Center and his fellowship training at Madigan Army Medical Center. After eleven years he left active service in the Army to begin his career at Baystate Medical Center. He is Chair of the Patient Safety & Quality Improvement for the Massachusetts section of ACOG and is Director of the Massachusetts Perinatal Quality Collaborative as well as Chair of the Western Massachusetts section of the March of Dimes.

Lauren Meade, MD, is a Graduate of University of California at San Francisco Medical School and currently an Associate Program Director in Medicine at Baystate. She identifies first and foremost as a ‘clinical educator’ and also as an educational researcher. As a clinical educator she has had a continuous healing relationship with her patients for more then 15 years and has watched her students thrive and later become scholars. Currently, she is a leading investigator in a multi-center educational study called Milestones for Essential Ambulatory Care which assesses the use of milestones for decisions regarding increased autonomy. Dr. Meade’s research team has worked in collaboration with ABIM and ACGME in the study.

Barbara Richard, MA, is currently the Director, Sponsored Programs Administration (SPA) office at Baystate. Barbara moved to Springfield in September 2010 from the Boston area where she had been Director of the Office of Sponsored Programs at Harvard Pilgrim Health Care; Assistant Director of the Sponsored Programs Administration office at Harvard Medical School; and Departmental Administrator for the Dept. of Pharmacology and Experimental Therapeutics and the Center for the Study of Drug Development at Tufts University Medical School. Barbara is an active member of the National Council of University Research Administrators (NCURA) and the Society for Research Administrators International (SRA).
John Romanelli, MD received his education at the University of Notre Dame, and graduated from the Medical College of Pennsylvania. He completed his General Surgery residency at Morristown Memorial Hospital in Morristown, NJ and a Minimally Invasive Surgery fellowship at the University of Massachusetts. Dr. Romanelli joined Baystate Medical Center in 2005. He is currently Assistant Professor of Surgery, Tufts University School of Medicine; Medical Director, Bariatric Surgery and Robotic Surgery, and Co-Director, Minimally Invasive Surgery Fellowship Program at Baystate Medical Center. He serves at Chairman of the Institutional Animal Care and Use Committee at Baystate Medical Center.

Anita Sarro, RN, MSN, JD, is the Research Integrity Officer with responsibilities for supporting research and scholarly activity throughout Baystate Health, including the Human Research Protection Program and the Baystat Animal Care Facility, ensuring that policies, procedures and practices are consistent with laws, regulations, and professional standards. She serves on the Research Conflict of Interest Committee, the Research Compliance Committee, and coordinates investigations and proceedings when necessary. Ms. Sarro is a registered nurse and a lawyer and practiced health care law for several years before joining Baystate.

Sallie Smith Schneider, PhD, is the director of the Center of Excellence in Apoptosis Research (CEAR) at the Pioneer Valley Life Sciences Institute (PVLSI). Dr. Schneider is also an adjunct assistant professor of veterinary and animal sciences at the University of Massachusetts Amherst, where she received her Ph.D. Dr. Schneider did her post doc at Harvard Medical School and obtained her B.A. from Skidmore College. Dr. Schneider’s research interests center the role of Secreted Frizzled Related Protein family members in regulating proliferation and death, understanding pathways to breast cancer susceptibility, and working with UMASS scientists to test polymer mediated delivery systems in vivo. Dr. Schneider is vice-chair for the Baystate IACUC committee and helps to coordinate the Baystate-Springfield Educational Partnership summer laboratory internship program for Springfield high school students with an interest in science.

Susan Swing, PhD, is vice president of outcome assessment at the ACGME. For the past several years her work has focused on development and implementation of the ACGME Outcome Project. Currently, she oversees all milestone development and participates on several milestone specialty groups and the Expert Panel as the ACGME staff director. Dr. Swing also directs the ACGME’s assessment group in its efforts to develop assessment processes for use in measuring resident performance against milestones. Previously, as director of the Outcome Project, she worked with advisory groups to develop the general competencies, an overall model assessment system, implementation plan and processes, and most recently standards for evaluating assessment tools. Dr. Swing is a co-developer of the ACGME/ABMS Toolbox of Assessment Methods and author of several articles on the Outcome Project. Dr. Swing received her PhD from the University of Wisconsin-Madison in educational psychology where her major areas of study were cognition, learning, and instruction; statistics; and research methods. Her early career years were spent as a teacher educator and educational researcher at Northwestern University’s School of Education and Social Policy.

Paul Visintainer, PhD, is the Director of Epidemiology and Biostatistics Research Core at Baystate Medical Center and Professor of Medicine at Tufts University School of Medicine. He received his doctorate in Epidemiology in 1986 from the University of Pittsburgh School of Public Health. After receiving his doctorate, he spent four years with the Henry Ford Health System in Detroit at a research epidemiologist. In 1993, he joined the faculty of New York Medical College and in 2003 became Department Chair in Epidemiology and Biostatistics. He has been with Baystate since 2008, collaborating with clinicians on clinical research. He has published more than 90 research articles, book chapters, and technical reports.
Academic Week Awards 2012

Innovation in Research
Clustering of Gene Expression on the Mouse Chromosome: A Spatial Analysis
Jane Garb, MS; Mary Hagen, PhD; Joseph Jerry, PhD; Jennifer Friderici, MS;
Sallie Schneider, PhD; Karen Dunphy, MS; Amy Roberts, MS .................................1

Significance in Research
Inpatient Stress Testing Reduces subsequent ED Visits and Readmissions for Chest Pain
Jaya Mallidi, MD, MHS; Srikanth Penumetsa, MD, MRCP; Jennifer Friderici, MS;
Fadi Saab, MD; Michael Rothberg, MD ..............................................................2

Excellence in Education Research
Identification of Performance Outliers Early in Residency – Boot Camp Performance Results
Gladys Fernandez, MD; Neal Seymour, MD; Marisa Amaral, MD; David Page, MD;
Nicholas Coe, MD; Richard Wait, MD ..............................................................3

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Project of the Departments of Emergency Medicine and Radiology
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Ann Maynard, MD; Karl Kamyk, MBA; Haiping Li, MD; Paul Visintainer, PhD .................4

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Minimally Invasive Surgery Fellow Abstract Recognition
Laparoscopic Implantation of Gastric Stimulator as an Effective Treatment Modality for Gastroparesis
David Earle, MD; Lee Farber, DO .......................................................... 29

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Risk Assessment of Early Venous Thromboembolic Prophylaxis in Head-Injured Patients
Melissa Cloonan, MD; Romie Mundy, MD; Scott Sinelli, DO; Reginald Alouidor, MD; Lisa Patterson, MD; Ronald Gross, MD .......................................................... 30
Clustering of Gene Expression on the Mouse Chromosome: A Spatial Analysis

Jane Garb, MS; Mary Hagen, PhD; Joseph Jerry, PhD; Jennifer Friderici, MS;
Sallie Schneider, PhD; Karen Dunphy, MS; Amy Roberts, MS

BACKGROUND
The cell and the chromosome within its nucleus comprise a scale of exploration and analysis not previously used in Geographic Information Systems (GIS). Now that chromosomal position is known for most genes in the human genome as well as for many mammalian species, spatial analysis of gene expression is possible. Various analytical methods have been applied to look for coordinated gene expression in microarray data, with significant results. These range from spectral analysis to simple correlation analysis. However all have methodological shortcomings, including their restriction to one spatial scale of analysis and the problem of false discovery, or falsely significant findings due to the multiplicity of statistical tests used.

OBJECTIVES
The aim of this project was to develop a method of gene analysis that was scale independent, provided a more accurate visualization of gene expression patterns than previous methods, and was not subject to the problem of multiplicity of statistical testing. To our knowledge, it is the first application of GIS using spatial statistics to analyze genetic data.

METHODS
This project was part of a larger study to identify mechanisms responsible for the reduced risk of breast cancer after full-term pregnancy. Gene expression levels were obtained from micro-array analysis of mammary tissue from 7 mice (3 parous and 4 nulliparous). According to the mean difference in expression level between parous and nulliparous mice, genes were classified as up- or down-regulated or non-differentiated. Using the starting location of each gene on the chromosome as the spatial reference point in a Cartesian coordinate system, we used GIS to map the differential expression levels for all 21,000 genes on the 20 chromosomes in the mouse genome. We conducted spatial cluster analysis with the Spatial Scan Statistic to identify clustering of up- or down-regulated genes.

RESULTS/OUTCOMES/IMPROVEMENTS
We found six statistically significant gene clusters of similarly up- or down-regulated genes associated with parity ranging from 2 to 150 genes per cluster across five chromosomes. Among these was a cluster of casein genes on Chromosome 5 previously demonstrated to co-regulate in pregnancy and which provided a validation of our cluster analysis method.

SIGNIFICANCE/IMPLICATIONS/RELEVANCE
GIS and spatial analysis provide unique solutions to methodological challenges in the analysis of gene expression. Our findings corroborate past research demonstrating that genes act in a coordinated fashion based on their spatial organization. This provides a mechanism for explaining the protective effect of parity on carcinogenesis. Identifying areas of coordinated gene expression on the chromosome can inform theories of gene regulation and highlight portions of the chromosome for further investigation through testing hypothesis and building models of gene activity. The discrete regions of chromosomes containing genes showing this enhanced response (up-regulation) in the present study suggest coordinated changes in the DNA structure which support pathways that inhibit tumors. Applications using this methodology present rich opportunities for collaboration between cell biologists, epidemiologists, spatial statisticians and GIS professionals in order to advance knowledge of genetic mechanisms.
Inpatient Stress Testing Reduces Subsequent ED Visits and Readmissions for Chest Pain

Jaya Mallidi, MD, MHS; Srikanth Penumetsa, MD, MRCP; Jennifer Friderici, MS; Fadi Saab, MD; Michael Rothberg, MD

INTRODUCTION
For patients admitted for observation of chest pain, stress tests increase length of hospitalization and cost, but offers reassurance that chest pain is non-cardiac. The effect of stress testing on subsequent resource use is unknown. We hypothesized that inpatient stress testing would reduce subsequent ED visits and readmissions for chest pain.

METHODS
We performed a retrospective cohort study using a hospital administrative database. All patients aged >=18 years who were admitted under “observation status” to Baystate Medical Center between January 2007 and July 2009 with admission diagnosis of Chest Pain or Angina Pectoris without acute coronary syndromes (ACS) and no admissions for 12 months prior were included. We compared subsequent ED visits and readmission rates within one year among patients who had a stress test at index admission vs. those who did not, using multivariate Poisson regression to adjust for age, gender, race, insurance status and comorbidities.

RESULTS
A total of 3134 chest pain patients were admitted during the study period; 2257 (72.0%) had a stress test during the index admission. Within 1 year, 286 (9.1%) patients returned to the ED at least once with chest pain, and 79 (27.6%) of these were readmitted during their first return visit. Patients who had a stress test at index admission were less likely than those who did not have a stress test to return to the ED (7.8% vs. 12.3%; p<0.001). In the multivariable model, a return ED visit was positively associated with Hispanic ethnicity (RR 1.79, 95% CI 1.32, 2.44), >1 cardiac comorbidity (RR 1.38, 95% CI 1.24, 1.54) and public insurance (RR 1.55, 95% CI 1.19, 2.00) and was negatively associated with stress testing (RR 0.73, 95% CI 0.58, 0.92). Once in the ED, however, the odds of admission were similar between those who previously had a stress test and those who did not (adjusted RR 0.93, 95% CI: 0.62, 1.37). Costs associated with readmission were reduced for those who underwent stress testing, but overall costs were lower for patients who did not ($ 4055 vs. $ 4670, P<0.001).

CONCLUSION
Among patients admitted observed for chest pain, immediate stress testing is associated with reduced readmission primarily by preventing ED visits for chest pain. Upon return to ED, stress testing is not associated with decision to admit.

PRESENTATIONS
Poster Presentation; AMERICAN HEART ASSOCIATION, Orlando, FL, November 2011
Identification of Performance Outliers Early in Residency – Boot Camp Performance Results
Gladys Fernandez, MD; Neal Seymour, MD; Marisa Amaral, MD; David Page, MD; Nicholas Coe, MD; Richard Wait, MD

BACKGROUND
The surgical education committee at our institution has recognized the challenges brought upon by duty hour regulations, and has implemented a simulation training curriculum, termed Boot Camp, in order to supplement the educational experience of surgical residency.

OBJECTIVE
A 9-week preparatory skills course for General Surgery residents, previously shown to predict subsequent educational and clinical performance, can also predict underperformance and success in progression through residency.

METHODS
At the start of each academic year between 2007 and 2010, all PGY-1 General Surgery residents (n=30) at Baystate Medical Center (Springfield, MA) underwent a 9-week preparatory course (Boot Camp) in cognitive and procedural skills related to fundamentals of surgical care. Skills were assessed with written tests and task-specific instruments. Residents were followed to determine successful progression through residency training.

MAIN OUTCOME MEASURE
Scores were expressed as mean percent of best possible score. Performance scores more than one standard deviation (SD) below the mean were identified. Outcome measures included completion of surgical training, progression from preliminary to categorical position, and avoidance of underperformance on post-Boot Camp assessments.

RESULTS
9 of 30 residents (30%) were identified as underperformers. All were in preliminary positions. 6 had received foreign undergraduate medical training. No Boot Camp underperformers completed training in the program and 2 did not complete the preliminary year. 4 preliminary and 17 categorical residents performed within 1 SD of mean, and had adequate post-Boot Camp assessments. 1 of these preliminary residents received a categorical PGY-3 position in the program.

CONCLUSION
Boot Camp performance can be used as an effective needs assessment tool that predicts underperformance later in residency. Strategies to use this information to benefit trainees should be a high priority.

PRESENTATIONS
New England Surgical Society, 92nd Annual Meeting, Oral presentation, New Hampshire, September 2011
Reducing Treatment Delays and Errors by Improving Communication:  
A Collaborative Project of the Departments of Emergency Medicine and Radiology

Fidela Blank, RN, MSN, MBA; John Santoro, MD; Khaldoon Al Dulaimy, MD; Ann Maynard, MD; Karl Kamyk, MBA; Haiping Li, MD; Paul Visintainer, PhD

BACKGROUND
There is a global perception in the emergency department that imaging procedures, particularly CT scans increase patients’ length of stay unnecessarily, and is associated with errors in treatment as in the case of miscommunication of preliminary verbal interpretations of imaging.

OBJECTIVE
To improve communication at every step of the work process from the time the imaging order is entered in CIS to the time the imaging report becomes available in CIS; outcome measurement: a reduction in average time from Order entry To receipt of imaging Results (OTR) and a reduction in the proportion of OTRs exceeding 2.5 hours

METHODS
3 Phases:
I- Description, analysis of current state, and recommendations for improvement came from the staff of both departments via focus group discussions, in-depth interviews and surveys.
II- Of the several recommendations from staff, two were implemented: dedicated transport (orderly will carry beeper dedicated for transport of patients to/from Radiology); and better, faster electronic documentation of preliminary/final radiology readings.
III- Evaluation: A global survey of staff repeated 6 months after implementation; and Head CT time variables collected (3 months pre and 3 months post interventions) to document any change.

RESULTS/OUTCOMES/IMPROVEMENTS
The Global Survey showed significant improvement in staff perception that preliminary reading documentation is occurring in a timely manner. Responses perceiving timeliness “most of the time” were 38% pre and 62% post. (Wilcoxon Rank-sum Test p=0.002)

We reviewed 891 Head CT pre- and 713 post-intervention, and found 73% pre, and 72% post-intervention turned around within 2 hours, essentially no statistical difference (Fisher’s test p=0.54).

![Table 1- Head CT Turnaround times](image)

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SIGNIFICANCE/IMPLICATIONS/RELEVANCE
The ED and Radiology staff collaborated in an attempt to solve the issue of timely completion of imaging and timely, accurate communication of results to reduce delays and errors in patient care. However due to constrained resources the task force of ED and Radiology was forced to choose only two recommendations for limited implementation. The 2 recommendations chosen for implementation, dedicated pagers for transport and electronic results within 2 hours of test completion were insufficient to produce a difference that is statistically significant. The staffs of both departments and the task force are in agreement on the prime importance of a dedicated transport system to/from radiology procedures, both for improved patient safety and efficiency of operations. The task force resolved to keep the issue of dedicated transport for radiology procedures on the table, to be revisited yearly until we get an adequate transport system in place.
Castleman’s Disease in Immunocompetent Pediatric Patient Population: A Report of Two Cases
Rebecca Levy, MD; Jonathan Freeman, MD; Vandita Johari, MD

BACKGROUND
Castleman’s disease (CD) is a rare lymphoproliferative disorder which can be localized or multicentric. Clinical features at presentation include fever, lymphadenopathy, cytopenia, and splenomegaly. There are three characteristic histologic patterns: hyaline vascular variant (HV), plasma cell variant (PV), and mixed cellular variant (MV). Classically, it presents in immunocompromised patients affected by human immunodeficiency virus, Kaposi sarcoma, Human Herpes Virus 8, Epstein-Barr Virus, and Non-Hodgkin Lymphoma.

OBJECTIVE/METHODS
Two immunocompetent pediatric patients, 13 and 15 years old, presented with multicentric lymphadenopathy, fever, nausea, vomiting, weight loss, and one child presented with acute renal failure. Complete blood counts for these patients revealed a variety of abnormal findings including anemia (normocytic and microcytic), absolute neutrophilia and leukocytosis. Lymph node biopsies were performed on both children.

RESULTS
The two cases displayed features of Castleman lymphadenopathy: HV and MV types. Microscopic features of HV included regressed transformed germinal centers, “onion-skinning” of mantle zone lymphocytes, and follicles with radially penetrating blood vessels. MV displayed features of HV plus interfollicular areas with florid vascular proliferation separated by sheets of plasma cells, small lymphocytes, and transformed immunoblasts. Studies for Human Herpes Virus 8 (HHV-8 immunohistochemical stain) and for Epstein-Barr virus (EBER in situ hybridization) were negative in both patients.

SIGNIFICANCE
Although CD frequently develops in immunocompromised patients, these cases highlight CD presenting in an immunocompetent pediatric group. An underlying etiology in these cases is unknown, without comorbid infections or immunodeficiency. Both patients were severely ill at presentation and one patient improved quickly with steroids, while the other required hospitalization for 28 days and treatment with steroids and Rituximab. Ultimately, both patients displayed good clinical outcomes and have not relapsed (1-6 years follow up). These patients may represent a rare subgroup of CD characterized by an immunocompetent pediatric group that presents with clinically severe symptoms but may achieve favorable outcome.

PRESENTATIONS
6th Annual Massachusetts Medical Society Research Poster Symposium
Poster Location: Massachusetts, December 2011
OBJECTIVE
Heart failure is a chronic health condition that is often characterized by frequent hospitalizations, complex medication regimens and high mortality rates. According to the Medicare Payment Advisory Commission, nearly one out of five Medicare patients hospitalized for heart failure is readmitted within 30 days of discharge. These readmissions are estimated to cost Medicare approximately $17.4 billion annually. The Patient Protection and Affordable Care Act legislation will allow the Centers for Medicare and Medicaid Services to withhold a portion of payments if a patient is readmitted within 30 days. Many health-systems have implemented interventions to reduce the rate of heart failure readmissions. Pharmacists have the training and expertise to provide effective medication-related education. However, data regarding the impact of pharmacy students and residents on decreasing readmission rates are limited.

METHODS
The current study is a prospective cohort study conducted at Baystate Medical Center to evaluate the impact of a pharmacy student and resident led discharge counseling program on heart failure patients discharged between October 1, 2011 and March 31, 2012. The primary endpoint of the study is the 30-day readmission rate of patients with heart failure that received discharge counseling. Secondary endpoints include assessment of patient satisfaction via a follow-up telephone survey and documentation of medication errors and discrepancies. For every endpoint, we will also report the outcome of student counseling and resident counseling individually to assess if there is a difference between the two.

RESULTS
Data collection and analysis are currently ongoing.

CONCLUSIONS
This study may demonstrate a novel method to improve heart failure readmission rates, patient safety and satisfaction in a financially conscious way.

PRESENTATIONS
Previously presented at the UHC annual meeting at MSHP Midyear. This was a poster presentation given in 12/11 in New Orleans, LA.
Implementation of a Decision Support Tool for Categorizing Clinical Pharmacy Interventions
Bayode Fashemi, PharmD; Audrey Bernard, PharmD; Adam Pesaturo, PharmD;
Jason Cross, PharmD; Mark Heelon, PharmD

BACKGROUND
The impact of pharmacy intervention has grown over the last decade as pharmacy expertise has increasingly been incorporated into the clinical decision making process. In order to quantify the impact of cognitive pharmacy services, institutions may utilize a documentation tool to track the clinical and economic impact related to their services.

Baystate Medical Center located in Springfield, MA, is a 659 bed tertiary care academic hospital. The institution utilizes an electronic medical record (eMR) with integrated computerized physician order entry (CPOE) (Powerchart, Cerner Corp., Kansas City, MO). The Department of Pharmacy Services currently uses an intervention documentation database incorporated into the eMR. This database is designed to capture and record pharmacy initiated interventions. The intervention database also tracks cost savings associated with pharmacy consults and adverse drug event prevention.

Cost savings calculation is achieved through the use of the Thomson Reuters ACTION OI healthcare database (Thomson Reuters Action O-I Comparative Database, 2005-2010). A cost is assigned to specific intervention categories and pharmacists must place each intervention scenario into these pre-specified categories. Although the documentation form is standardized, there is a lack of consensus regarding the appropriate category to assign a particular intervention. Due to the accuracy needed when assigning and reporting cost savings, a designated pharmacist devotes eight hours every month adjudicating targeted documented interventions. This process involves reassigning documented categories if the clinical scenario narrated in the database by the documenting pharmacist is deemed more appropriate for a different category.

Objectives
Evaluate the utility of an intervention category decision support tool.

METHODS
The current study is a prospective study evaluating the utility of an intervention category decision support tool and designing a reproducible standardization process. Category change rates from documented pharmacy intervention data during the months of October and November 2011 will be used as baseline data. After education and implementation of the standardized decision support tool, category change rates from January and February 2012 will be assessed and compared to baseline data. The primary objective compares the category change rates before and after implementation of the tool. Secondary objectives will compare the rate of pharmacy interventions per 1000 patient days, cost avoidance, pharmacist documentation confidence, and change in time devoted to adjudication before and after implementation

Results
Data collection and analysis is currently underway.

SIGNIFICANCE/IMPLICATIONS/RELEVANCE
The increased accuracy of documentation will better gauge the financial impact of Pharmacy services to the institution. The documented interventions will not only be utilized as benchmarking and workflow data, but also serve to justify pharmacy lead initiatives such as role expansions, decentralization, and FTE budgeting.

PRESENTATIONS
United Health System Consortium, Poster Presentation, New Orleans, LA December 2011
Efficacy of High Dose Daptomycin in the Treatment of Staphylococcus Aureus Bacteremia
Erica Tenholder, PharmD, BCPS; Kendra Decelle, PharmD; Evan Horton, PharmD; Jennifer Schimmel, MD; Jane Garb, MS

BACKGROUND
Due to increased virulence and emerging reports of daptomycin resistance, doses above the FDA approved 6 mg/kg/day are often used. Although safety surveillance studies have demonstrated the safety of daptomycin up to doses of 12 mg/kg/day, no published studies have shown efficacy of high dose daptomycin (>6mg/kg/day) over traditional dosing (6 mg/kg/day) in Staphylococcus aureus bacteremia. This study will examine the efficacy of high dose daptomycin compared to traditional dosing in Staphylococcus aureus bacteremia.

OBJECTIVES/METHODS
The current study is a single center, retrospective chart review at Baystate Medical Center collected from June 2007 to October 2011. Patients with at least one positive blood culture for Staphylococcus aureus and at least one dose of daptomycin will be eligible. Patients less than 18 years old, receiving hemodialysis, and pregnant patients will be excluded from this study. Patients will be stratified into two groups, traditional dose daptomycin (6 mg/kg/day) and high dose daptomycin (>6 mg/kg/day). The primary endpoint of this study is efficacy of traditional dosing versus high dose daptomycin based on evaluation of time to microbiological cure, defined as time from first dose of daptomycin to first negative blood culture. Secondary endpoints include length of hospital stay and total drug cost. These endpoints will be measured in days and dollars, respectively.

RESULTS/OUTCOMES/IMPROVEMENTS
Currently under investigation and will be completed by the end of April.

SIGNIFICANCE/IMPLICATIONS/RELEVANCE
It is anticipated that this study will demonstrate that high dose daptomycin is non-inferior to traditional dosing of daptomycin in terms of time to microbiological cure for the treatment of Staphylococcus aureus bacteremia at Baystate Medical Center.

PRESENTATIONS
American Society of Health System Pharmacists Midyear Conference, New Orleans, LA 12/2011

Ryan Coute, BS; Timothy Mader, MD; Adam Kellogg, MD; Scot Millay, MD; Lennard Jensen, DO

BACKGROUND
According to the 3-phase time-sensitive model of VF, the metabolic phase begins after 10 minutes of untreated cardiac arrest. Optimal CPR duration prior to first rescue shock (RS) to maximize the probability of successful defibrillation during this phase remains unknown.

OBJECTIVE
The purpose of this study was to determine if 3 minutes of CPR prior to first RS is sufficient to achieve ROSC after 12 minutes of untreated VF.

METHODS
This is a secondary analysis of prospectively collected data from an IACUC approved protocol. Forty-eight Yorkshire swine (weighing 25-30 kg) were instrumented under anesthesia. VF was electrically-induced. After 12 minutes of untreated VF, CPR was initiated (and continued prn) and a standard dose of epinephrine (SDE) (0.01mg/kg) was given. The first RS was delivered after 3 minutes of CPR (and every 3 minutes thereafter prn). A failed RS was followed by SDE along with (in series) vasopressin (VASO [0.57mg/kg]), amiodarone (AMIO [4.3mg/kg]), and sodium bicarbonate (BICARB [1mEq/kg]) prn. Resuscitation attempts continued until ROSC was achieved or 20 minutes elapsed without ROSC. The primary outcome measures were ROSC (SBP>80 mmHg for >60s) and survival (SBP>60 mmHg for 20 minutes). Data were analyzed using descriptive statistics. Vasopressor support was available to maintain SBP>60 mmHg following ROSC.

RESULTS
ROSC was achieved in 25 of the 48 (52%) animals. Survival occurred in 23 of the 48 (48%) animals. Of the 25 animals who achieved ROSC, 1 (4.0% [95%CI 0.01-19.5]) occurred on first RS attempt, 15 (60.0% [95%CI 40.7-76.6]) occurred on second RS attempt, 3 (12.0% [95%CI 4.2-30.0]) occurred on third RS attempt, and 6 (24.0% [95% CI 11.5-43.4]) required >3 RS attempts.

CONCLUSION
Our data suggest that during the metabolic phase of VF, 3 minutes of CPR and 1 SDE may be insufficient to achieve ROSC on first RS attempt. A longer duration of CPR and/or additional vasopressors may increase the likelihood of successful defibrillation on first attempt.

PRESENTATIONS
Presented at the Society of Academic Emergency Medicine Northeast Regional Conference: Springfield, MA
March 21, 2012

Accepted for presentation at the Society of Academic Emergency Medicine National Conference: Chicago, IL, May 10, 2012
SFRP1 Reduction Results in an Increased Sensitivity to TGF-β Signaling
Kelly Gauger, PhD; Kerry Chenausky; Molly Murray; Sallie Schneider, PhD

BACKGROUND
Transforming growth factor (TGF)-β plays a dual role during mammary gland development and tumorigenesis and has been shown to stimulate epithelial-mesenchymal transition (EMT) as well as cellular migration. The Wnt/β-catenin pathway is also implicated in EMT and inappropriate activation of the Wnt/β-catenin signaling pathway leads to the development of several human cancers, including breast cancer. Secreted frizzled-related protein 1 (SFRP1) antagonizes this pathway and loss of SFRP1 expression is frequently observed in breast tumors and breast cancer cell lines. We previously showed that when SFRP1 is knocked down in immortalized non-malignant mammary epithelial cells, the cells (TERT-siSFRP1) acquire characteristics associated with breast tumor initiating cells. The phenotypic and genotypic changes that occur in response to SFRP1 loss are consistent with EMT, including a substantial increase in the expression of ZEB2.

OBJECTIVES
Considering that ZEB2 has been shown to interact with mediators of TGF-β signaling, we sought to determine whether TGF-β signaling is altered in TERT-siSFRP1 cells.

METHODS
Luciferase reporter assays and real-time PCR analysis were employed to measure TGF-β transcriptional targets. Western blot analysis was used to evaluate TGF-β-mediated ERK1/2 phosphorylation. Migration chamber assays were utilized to quantify cellular migration. TERT-siSFRP1 cells were transfected with Stealth RNAiTM siRNA in order to knock-down the expression of ZEB2.

RESULTS
TERT-siSFRP1 cells exhibit a significant increase in both TGF-β-mediated luciferase activity as well as TGF-β transcriptional targets, including Integrin β3 and PAI-1. Phosphorylation of ERK1/2 is increased in TERT-siSFRP1 cells in response to enhanced TGF-β signaling. Furthermore, when the TGF-β pathway is blocked with a TGF-βR antagonist (LY364947), cellular migration is significantly hindered. Finally, we found that when ZEB2 is knocked-down, there is a significant reduction in the expression of exogeneous and endogenous TGF-β transcriptional targets and cellular migration is impeded.

IMPLICATIONS
We demonstrate that down-regulation of SFRP1 renders mammary epithelial cells more sensitive to TGF-β signaling which can be partially ameliorated by blocking the expression of ZEB2, a key transcription factor that regulates the progression of tumor cell metastasis. Hence, ZEB2 may be an excellent anti-cancer therapeutic target.

PRESENTATIONS
Poster Presentation: Keystone Symposia: Epithelial Plasticity and Epithelial to Mesenchymal Transition, Vancouver, BC January 2011
Poster Presentation: American Association for Cancer Research, Florida, April 2011

PUBLICATIONS
BMC Cancer; SFRP1 reduction results in an increased sensitivity to TGF-β signaling; Kelly J. Gauger, Kerry L. Chenausky, Molly E. Murray, and Sallie Smith Schneider; February 2011; 11 (1): 59

PREVIOUS AWARDS
Keystone Symposia Scholarship
Keystone Symposia; January 2011
ABSTRACT RECOGNITION: FACULTY

Actively Targeted Delivery of Cell Conjugated Prodrugs
Sallie Schneider, PhD; Todd Emrick, PhD; Richard Arenas, MD; Nicholas Panzarino; Samantha McRae

BACKGROUND
Toxicity resulting from systemic administration continues to limit the effectiveness of conventional drug delivery. Despite recent advances, systemically administered nanoparticles designed to exploit the enhanced permeability and retention (EPR) effect still display off-target accumulation and are unable to overcome the elevated pressure gradient found in wounds and tumors. The conjugation of polymer prodrugs to tumor and wound homing Mesenchymal Stem Cells will allow for greatly improved drug targeting and active transport against the pressure gradient, improving drug efficacy and reducing or eliminating systemic toxicity.

OBJECTIVES
1. To conjugate the biocompatible zwitterion known as polyMPC to homing Mesenchymal Stem Cells (MSCs)
2. To determine the nature of polymer binding and its effects on MSCs
3. To examine how polymer composition affects binding, stability, trafficking, or toxicity

METHODS
Polymers with varying compositions and zwitterionic-to-PEG (i.e., polyMPC-to-PEG methacrylate) ratios were synthesized for attachment to MSCs. To conjugate the polymers to MSCs, the polymers were functionalized with a chain-end maleimide, forming covalent bonds with thiols (-SH) present on MSC surface proteins. Conjugation was carried out with cells in suspension in serum free DMEM media at 37 °C and 5% CO2 with 100ul of a 1 mg/ml polymer stock in PBS. Cells were pelleted and washed to remove unbound polymer and analyzed by FACs and confocal microscopy.

RESULTS
MSCs were successfully modified with maleimide-functionalized polyMPC. Polymer binding did not induce toxicity, and the conjugates remained stable for at least 72 hours. All polymers were found to be endocytosed, and do not appear to be present in endosomes, vesicles, or the cell nucleus. While polymer composition did not influence binding or trafficking, the chain-end proved critically important, as the maleimide functionalized polymers bound at much greater levels than the maleimde lacking control polymers.

SIGNIFICANCE
1. Stable conjugation of polymers to Mesenchymal Stem Cells allows for exploitation of their active homing abilities to deliver polymer prodrugs.
2. Active transport of drugs by homing cellular vehicles will improve drug efficacy and therapeutic index by increasing the concentration of drug at the target site while decreasing the systemic concentration and toxicity of the drug.
3. This method of active drug targeting will allow for new drugs to be designed and used that are not constrained by toxicity resulting from systemic administration.
Mitochondrial Superoxide Dismutase 2, Rather Than Cytoplasmic Catalase Antioxidant, Ameliorates Better High Glucose (HG) Induced Adipogenesis in Human Subcutaneous Mesenchymal Stem Cells (MSCs)

Sabyasachi Sen, MD, PhD; Mary Young, MA; Nagendra Yadava, PhD

BACKGROUND
Primary MSCs can differentiate into mature adipocytes, osteocytes or chondrocytes. We examined gene expression (qRT-PCR) of MSCs exposed to HG. Adipogenic differentiation was confirmed by Oil Red O stain. We postulated that reactive oxygen species (ROS) production secondary to HG exposure may be the cause of increased adipogenesis in MSCs. Thus, intra-cellular antioxidants could counteract the adverse differentiation potential of HG

METHODS
We exposed hMSCs to HG, 25mM and normal glucose , 5.5 mM for 10 days. Using FACS, ROS generation was analyzed using DCF-DA dye and apoptosis by AnnexinV-Propidium Iodide stain. We also transduced hMSCs with Adenovirus containing SOD2(also known as MnSOD) or Catalase (CAT) at 100 MOI before exposing to HG. Ad-eGFP (green fluorescent protein) was the control vector. We interrogated mitochondrial respiration (Seahorse) and complexes 1 and 2 protein by BN-PAGE and SDS-PAGE

RESULTS
HG increased hscMSC lipid accumulation (3.5 fold), induced ROS production intra-cellularly and promoted apoptosis. HG increased adipogenic gene expression of Leptin (LEP, 10-fold), Perilipin (PLIN; 4-fold) and PPARG (16 fold) while it reduced bone formation markers Alkaline Phosphatase (ALPL, 4 fold) and osteocalcin (BGLAP-1.6 fold) mRNAs. Ad- SOD2 more than CAT transduction improved MSC survival and deceased adipogenic markers. Seahorse and mitochondrial complex analyses indicated impaired mitochondrial respiration and suppressed complex 1 protein expression in HG exposed MSCs

CONCLUSIONS
Over-expression of intra-cellular anti-oxidants help to prevent adipogenesis (SOD2>CAT). Mitochondrial respiration and function is impaired in HG which may be reversible by SOD2 up-regulation. Our findings emphasize the role of intracellular mitochondrial anti-oxidant upregulation, in preventing adipogenic differentiation of MSCs in HG.

PRESENTATIONS
The Obesity Society Annual Session Poster Abstract Oct 2011

PUBLICATIONS
NATURE (OBESITY) VOLUME 19 SUPPLEMENT 1 | NOVEMBER 2011 | S-24.
www.obesityjournal.org
Correlation Between Change in Dyspnea Severity and Clinical Outcome in Patients with Acute Heart Failure

Howard Smithline, MD; Richard Barus; Fidela Blank, RN; Ryan Coute; Haiping Li

INTRODUCTION
Change in dyspnea severity (DS) is a frequently used outcome measure in trials of acute heart failure (AHF). However, there is limited information concerning its validity.

OBJECTIVE
To assess the predictive validity of change in dyspnea severity.

METHODS
This was a secondary analysis of a prospective observational study of a convenience sample of AHF patients presenting with dyspnea to the ED of an academic tertiary referral center with a mixed urban/suburban catchment area. Patients were enrolled weekdays, June through December 2006. Patients assessed their DS using a 10-cm visual analog scale at 3 times: the start of ED treatment (baseline) as well as at 1 and 4 hours after starting ED treatment. The difference between baseline and 1-hour was the 1-hour DS change. The difference between baseline and 4-hour was the 4-hour DS change. Two clinical outcome measures were obtained: 1) the number of days hospitalized or dead within 30 days of the index visit (30-day outcome), and 2) the number of days hospitalized or dead within 90 days of the index visit (90-day outcome).

RESULTS
Data on 86 patients were analyzed. The median 30-day outcome variable was 6 days with an interquartile range (IQR) of 3 to 16. The median 90-day outcome variable was 10 days (IQR: 4 to 27.5). The median 1-hour DS change was 2.6 cm (IQR: 0.3 to 6.7). The median 4-hour DS change was 4.9 cm (IQR: 2.2 to 8.2). The 30-day and 90-day mortality rates were 9% and 13% respectively. The spearman rank correlations and 95% confidence intervals are presented in the table.

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<td>4-hour DS change vs 30-day outcome</td>
<td>-0.314</td>
<td>(-0.514 to -0.082)</td>
</tr>
<tr>
<td>1-hour DS change vs 90-day outcome</td>
<td>0.016</td>
<td>(-0.196 to 0.227)</td>
</tr>
<tr>
<td>4-hour DS change vs 90-day outcome</td>
<td>-0.307</td>
<td>(-0.508 to -0.073)</td>
</tr>
</tbody>
</table>

CONCLUSION
While the point estimates for the correlations were below 0.5, the 95% CI for two of the correlations extended above 0.5. This pilot data supports change in DS as a valid outcome measure for AHF when measured over 4 hours. A larger prospective study is needed to obtain a more accurate point estimate of the correlations.

PRESENTATIONS

PUBLICATIONS
Smithline HA, Barus R, Coute R, Blank FSJ. Correlation Between Change in Dyspnea Severity and Clinical Outcome in Patients with Acute Heart Failure. Acad Emerg Med 2012 May; 19(5) Suppl 1: Sxxx
P53 Silenced Endothelial Progenitor Stem Cells (EPC) Improve Collateral Circulation Post-Femoral Artery Occlusion in Diabetic Mice
Sabyasachi Sen, MD, PhD; Mary Young, MA; Cyril Chou, BA; Joseph Jerry, PhD

Literature shows that EPCs contribute to increased collateral vessel formation following vaso-occlusion. However diabetes reduces EPC number and reduces collateral vessel formation.

We cultured human EPCs and exposed them to 5.5 mM (equivalent to 99mg%) and 20mM (equivalent to 360mg%, HG) glucose, which resulted in significant EPC death within 48hrs. We noted HG exposure was associated with up-regulation of P53 and its downstream genes such as P21, PUMA and Caspase-3.

We hypothesized that EPC reduction in hyperglycemia is secondary to up-regulation of pro-apoptotic gene, P53.

We obtained mouse peripheral blood derived EPCs from P53 null mice and observed that p53 KO EPCs are more resistant to cell death in HG. P53 null EPCs evolved into mature mouse EC (MEC) and retained endothelial properties such as cobblestone appearance and tube-formation on matrigel. Next, we used Lenti and Adenovirus mediated si-RNA methods to silence P53 (long and short term respectively) in human EPCs and P53 silenced EPC showed better survival in HG. We developed femoral artery occlusion model to mimic peripheral vascular disease in diabetic animals. We used streptozotocin induced type 1 diabetic or Leptin resistant type 2 diabetic mouse model. We delivered saline, P53 WT and P53 null EPCs intra-muscularly around the femoral occlusion in these mouse models (n=10 in each group) and counted CD31+ve number of capillaries in a 20x microscopic field. Highest number was noted in the group that received P53null EPCs (26.3±4.2, 49.6±7.4 and 95.7±9.7 respectively).

SUMMARY
Transplantation of P53 null EPCs in hyperglycemic mice with femoral occlusion demonstrate better collateral vessel formation post femoral artery occlusion setting compared to WT-EPC transplanted group.

CONCLUSION
This finding indicates towards possible therapeutic benefit in transplanting short-term P53 silenced human EPC to prevent peripheral vascular disease in patients with diabetes.

PRESENTATIONS
To be presented Oral and Poster, at Atherosclerosis and Vascular Biology Council of American Heart Association Annual Session in April 2012.

PREVIOUS AWARDS
Dr. Sen received Young Investigator Award from AHA for this abstract.
Glioblastoma-Derived Tumor Cells Induce Vascular Mimicry through VEGF-Independent Flk-1 Activation

Ralph Francescone, MS; Steve Scully, MD; Brooke Bentley; Sherry Taylor, MD; Wei Yan; Dennis Oh, MD; Luis Moral, MD; Rong Shao, PhD

BACKGROUND
Glioblastoma (GBM) is the most common type of brain cancer and the most fatal. GBM is a highly vascularized tumor, consisting of endothelial cell angiogenesis and tumor cell vessels known as vascular mimicry (VM). Current therapies target angiogenesis and offer minimal benefit to the patient. On the other hand, little is understood about vascular mimicry, and this study explores a potential mechanism of VM by which new therapies can be developed.

METHODS
Two GBM cell lines, U87 and GSDC, were used to investigate the mechanisms of vascular mimicry. The GSDC cell line was directly isolated from Baystate Medical patient tumor tissue with their consent. Human GBM tumor tissue protein expression was analyzed by immunohistochemistry and immunofluorescence. We employed immunoblot analysis to investigate the signaling pathways involved with VM. Matrigel tube formation assay was used to measure VM in vitro. Short hairpin RNA was used to reduce expression of target proteins. Lastly, SCID/Beige mice were used in the GBM xenograft animal models, with IACUC approval.

RESULTS
We found that vascular channels of VM in GBM were composed of mural-like tumor cells that strongly express VEGF receptor 2 (Flk-1). To explore a potential role of Flk-1 in the vasculogenesis, we investigated two glioblastoma cell lines U87 and GSDC, both of which express Flk-1 and exhibit a vascular phenotype on Matrigel. Treatment of both cell lines with either Flk-1 gene knockdown or Flk-1 kinase inhibitor SU1498 abrogated Flk-1 activity and impaired vascular function. Furthermore, inhibition of Flk-1 activity suppressed intracellular signaling cascades including focal adhesion kinase and mitogen-activated protein kinase Erk1/2. In contrast, blockade of VEGF activity by a neutralizing antibody Bevacizumab failed to recapitulate the impact of SU1498, suggesting that Flk-1-mediated VM is independent of VEGF. Xenotransplantation of SCID/Beige mice with U87 cells and GSDCs gave rise to tumors harboring robust mural cell-associated vascular channels. Flk-1 shRNA restrained VM in tumors and subsequently inhibited tumor development.

CONCLUSION
Collectively, all the data demonstrate a central role of Flk-1 in the formation of VM in GBM. This study has shed light on molecular mechanisms mediating tumor aggressiveness and also provided a therapeutic target for patient treatment.

PUBLICATIONS
Journal of Biological Chemistry (under revision) Glioblastoma-Derived Tumor Cells Induce Vascular Mimicry through VEGF-Independent Flk-1 Activation; Francescone R, Scully S, Bentley B, Wei Yan, Taylor SL, Oh D, Moral L, Shao R.
ABSTRACT RECOGNITION: NURSING AWARD WINNER

Improving Pain Management in Chestnut Daystay Surgery: Comparing Nurses’ Pain Knowledge and Pre-emptive Versus No Pre-emptive Analgesia in a Case Controlled Series
Susan Powell, RN; Alison Colburn, RN; Paula Lusardi, RN, PhD

BACKGROUND
Surgery almost always results in post-operative pain, ranging from mild to severe (Hutchinson, 2007; Wells et al., 2009). Though knowledge and understanding are increasing, widespread under-treatment of this pain remains. Pain has well-substantiated consequences including physiologic, mental and emotional stress (Apfelbaum et al., 2003; Dunwoody et al., 2008; Lamer & Lutz, 1990; Layzell, 2008; McCaffery et al., 1999; McNeill et al., 2004 Mertin et al., 2007; Wells et al., 2009). Pain management must be vastly improved to minimize adverse outcomes for patients and health systems (Dunwoody et al., 2008; Hutchinson, 2007; McNeill et al., 2004; Pasero et al., 2003; Polomano et al., 2008: Wells, 2009). One quick, easy, inexpensive method that may yield positive results is the administration of pre-emptive oral analgesics medications before surgery (NIH, 8/2007; Ochroch et al., 2003; Woolf, 1983, 1993). The literature is equivocal regarding the effects of pre-emptive analgesia.

OBJECTIVES
The short-term goals are two-fold: first, to determine if simple, quick, inexpensive pre-emptive analgesia will be efficacious in reducing post-operative patient reports of pain and, second, to determine whether Chestnut Surgery Center PACU nursing knowledge on this topic can be improved with a self-learning packet. The long-term objective is to improve the care, the experience and the satisfaction of Chestnut’s outpatient surgery patients by decreasing pain.

DESIGN
Patients: Quantitative retrospective comparison of 49 pairs of patients, matched for gender and surgical procedure: 49 people who received oral pre-emptive analgesia in the pre-operative area to a cohort who did not receive oral pre-emptive analgesia. Nurses: Quantitative comparison pre/post-test with self-learning packet. Instruments: Pain verbal reporting scale (0-10), PI developed knowledge test with good face validity. Phases are as follows: Phase I: Nurses’ completion of pre-/post-tests and self-learning packet on pain management; Phase II and III: Retrospectively review patient charts until 50 pairs of patients, matched for gender and surgical procedure are attained; capture 3 points of pain score data. Analysis: Compare pain scores recorded at three points in time between patients that received pre-emptive oral analgesics to a cohort that did not receive pre-emptive analgesia. Compare nursing pre-/post-tests for improvement after utilizing self-learning packet on pain management.

RESULTS/OUTCOMES/IMPROVEMENTS
Forty-nine patient pairs participated in this study with 69.4% being female. Forty nine patients received pre-emptive analgesia and 49 patients did not receive pre-emptive analgesia. Data was analyzed in terms of gender, type and amount of pre-emptive drugs used, and pain scores. In the pre-emptive analgesia group, over 90% of patients received acetaminophen 650 mg or 975 mg, over 80% received celecoxib 400 mg, 95% received oxycontin 10 mg. In terms of pain scores, pain scores were on average approximately one-half point higher for the non-pre-emptive compared to the pre-emptive patient in each patient pair on both PACU admission and discharge. Mean pain scores for both types of patients were low in both time periods. Conversely, scores were slightly higher for both types of patients the following day (mean = 3.1 and 3.4 respectively) but there was still no significant difference in patient pairs, with pre-emptive patients having slightly higher pain scores (p = 0.43) between pairs. Results did not differ significantly for males or females. The conclusion is that preemiptive medication did not significantly affect postoperative pain. In addition, all PACU nurses received a teaching intervention about pain management. Twenty-five nurses completed pre-and post-intervention knowledge tests. Prior to intervention, participants who took both tests scored a mean of 77.6 points out of 100. There was a significant increase in knowledge scores after intervention. The mean increase in test scores after intervention was 7.6 points, which was statistically significant (t = -4.3, df=24, p = 0.0002).

SIGNIFICANCE/IMPLICATIONS/RELEVANCE
Results are significant in both intervention arms, patients and nurses. For years, the literature has been equivocal regarding the use of pre-emptive analgesia for patients. This robust study suggests that pre-emptive analgesia does not affect post operative pain scores. More analysis needs to be done regarding timing of medications, analgesia used and measurement of pain immediately after surgery when it is difficult to measure patients’ responses. Increasing the nurses’ pain intervention knowledge was significant. Nurses are the front line regarding patient comfort. Clearly classes on pain for PACU nurses are helpful and should be repeated annually.

PRESENTATIONS
10/24/10 Improving Pain Management in Daystay Surgery: Comparing nurses’ pain knowledge and pre-emptive versus no pre-emptive analgesia in a case controlled seriesPowell, S; Peri-anesthesia Nursing Conference, Baystate Medical Center, featured speaker.
5/8/10 Improving Pain Management in Daystay Surgery: Comparing nurses’ pain knowledge and pre-emptive versus no pre-emptive analgesia in a case controlled series Powell, S; Colburn, A.; Lusardi, P. (mentor), Nursing Grand Rounds, Presentation, Baystate Medical Center
Latent Safety Threat (LST) Simulation for Hospital of the Future
Cinnamon Desgres, RN; Denise Schoen, RN; Gladys Fernandez, MD

OBJECTIVE
The purpose of this process improvement endeavor was to provide in-situ simulation-based experiences in a new hospital care area with the goal of determining where latent safety threats (LSTs) may exist related to new environment and new technology. Simulated encounters were developed for care of patients in elective vascular and emergent cardiac surgical settings. Designated transitions of care to multiple care areas within care units provided opportunity to identify potential or real threats to patient and staff safety and prospect for resolution prior to moving into the new hospital.

METHOD
This project utilized the tracer method of management of one patient in a new facility employing simulation to test resources, systems, space design, technology, personnel and workflow for LSTs. An interprofessional education and assessment of macrosystem processes was applied with planning including preparatory team meetings, rehearsals, experiential team-based simulation encounters, pre-simulation briefings and immediate post-simulation team debriefings.

RESULTS/OUTCOMES/IMPROVEMENTS
Significant LSTs:
- Orientation-LSTs: Way-finding for existing and new staff, in routine and emergent situations
- Technology-LSTs: Activation of emergency systems such as Code Blue or RRT calls with overhead Code Blue only audible in old and not in new building
- Technology-LSTs: Code alarm not audible on unit despite policy-driven activation; technology not completely implemented nor orientation complete
- Space/Design-LSTs: Limitation of designated patient transport elevator size B3 (Care to HVCC) if patient transport requiring multiple devices such as ventilators and drips
- Space/Design-LSTs: HVCC room setup for equipment architecturally suboptimal for access to head of the bed or ease of incorporation of multiple devices and portable machines (X-ray)
- Space/Design-LSTs: OR room set up with fluoroscopy C-arm, boom and monitor needs testing for positioning and visualization; need change in booking checklist forms
- Space/Design-LSTs: Large patient > 500 lbs or > 6'5" will need reversal of OR room set up; need change in booking checklist forms

SIGNIFICANCE/IMPLICATIONS/RELEVANCE
Latent Safety Threats were identified at multiple levels: (1) orientation needs to avoid delays in transport and care, (2) technology implementation and assessment needs at developer and user levels to avoid never-events or missed opportunities related to team communications, and (3) space/design needs related to provision of safe and quality care by interprofessional teams. Certain identified process concerns were actually resolved prior to implementation of simulation activities (way-finding orientation cards developed, HVOR boom height adjustments) and multiple other areas have been corrected since implementation (e.g. Code Blue alarm testing continued and resolved, redesign of route for transporting patients to HVCC from CARE unit, HVCC room setup recalibrated, HVOR room setup recalibrated).

The relevance of these findings has been noted by stakeholders and providers as an avenue toward addressing patient safety, healthcare quality and systems-based practice assessments prior to utilization of new care areas. The impact of these sessions has led to requests for continued process improvement endeavors utilizing in-situ simulation for future strategies of assessment of the new Emergency Department workflow, transitions related to new Helipad location, transfers in and out of the new and existing structures for varied scenarios of care.
Human Patient Simulation vs. Written Case Studies for New Graduate Nurses in Nursing Orientation: A Pilot Study
Denise Schoen, MSN, RN-BC; Arlene Kruzel, MSN, RN-BC; Joan Roche, PhD, RN, GCNS-BC

BACKGROUND
Professional nurse educators in acute care are challenged to increase the level of clinical performance of new graduate nurses. There is a gap between the knowledge gained in the academic setting and the transformation of this knowledge into clinical skills necessary for practice. Human Patient Simulation (HPS) is a potential tool to bridge this gap. New nurses can participate in simulated clinical situations without risking harm to patients. There is little research on the effectiveness of HPS or other methods available to facilitate this process.

METHOD
This quasi-experimental pilot study compared the clinical performance, satisfaction with orientation, and employment outcomes of two groups of new graduate nurses: one group completing human patient simulation (HPS) scenarios and one group completing written case studies on the same complex clinical cases. The stratified purposive sample included twenty new graduate nurses.

RESULTS
There were no differences in satisfaction with orientation or retention between the two groups. There were no differences in assessment, interventions, or communication performance between the two groups. The experimental group (HPS) performed better on safety behaviors than the control group (written case studies).

CONCLUSIONS
The pilot data on safety performance provided insights for a larger study comparing these two teaching methods.

PUBLICATIONS
ABSTRACT RECOGNITION: NURSING HONORABLE MENTIONS

Decreasing Potential liability and Improving Patient Outcomes through Increased Nurse-Physician Collaboration in the ICU

Paula Lusardi, RN, PhD; Karen Shea, RN; Pam Trench, RN; Cindy Killian, RN; Mary Talbot, RN; Virginia Brown, RN; Gayle Ryan, RN; Beth Henneman, RN; Elizabeth Ginepro, RN; William McGee, MD

BACKGROUND
The positive impact of collaboration on patient care outcomes has been nationally recognized for over twenty years and nurses’ perceptions of collaboration in ICUs have been linked with better patient outcomes and nurse retention. While collaborative models of care are advocated, collaboration among health care professionals, especially nurses and physicians, is the exception rather than the rule. Poor collaboration often leads to medical errors and poor patient outcomes, particularly in the intensive care unit (ICU). Collaboration, a process of working together is a suggested solution to problems arising from the hierarchical workplace. Positive nurse-physician collaboration should decrease the probability of adverse effects from high risk situations. According to data collected in the ICU, we understood that we might be able to improve our outcomes through better collaboration.

OBJECTIVE
Improve RN/MD collaboration and decrease medical errors.

METHODS
Mixed method, qualitative and quasi-experimental non equivalent control group design.

Research question: To what extent will reconfiguration of rounds improve RN/MD collaboration, decrease the number/severity of error reports, recidivism, and ethics reports? Measurement tools: Shea communication tool/Baggs’s Collaboration and Satisfaction about Care Decisions (CSACD) tool.

Project description: Using diffusion of innovation theory, we reconfigured rounds; implemented education processes; conducted focus groups; observed interdisciplinary round processes.

Analysis: We compared pre/post intervention data related to RN/MD collaboration and patient care outcomes.

RESULTS/OUTCOMES/IMPROVEMENTS
Selected results: Compliance with rounds: RNs participate but MDs describe participation as sporadic; Consultant findings: Teams in various stages of adopting skills; Focus groups: Collaboration—a function of the individuals involved; large variation in the conduct of rounds; Collaboration: CSACD – RN/MD collaboration scores increased; MDs believe that collaboration is better than the RNs think it is; Shea Communication tool – Communication increased across groups; need for mutual respect; Error reports: Significant/non significant differences in medical errors; Recidivism: Rate stable at 5%; Ethics’ report: Ethics reports generated.

Significance/Implications/Relevance: While communication improved, error rates were mixed. According to our qualitative data, RNs felt their voices were not always heard and that collaboration must be based in mutual respect with the individuals involved; while rounds were usually well attended by nurses, physicians felt nurses were not involved in rounds; work remains to improve collaboration during rounds and in the unit. Work is ongoing.

PRESENTATIONS


ABSTRACT RECOGNITION: NURSE HONORABLE MENTIONS

Implementation of Breastfeeding Curriculum to Increase Breastfeeding Knowledge and Improve Attitudes Toward Breastfeeding in Pediatric Residents

Shirley Hamill, RN; Paula Lusardi, RN, PhD

BACKGROUND
The health effects of breastfeeding are well recognized by the American Academy of Pediatrics (AAP), HealthyPeople 2020, the First Lady, Michelle Obama, and most recently, the US Surgeon General. Breast milk is uniquely suited to the human infant’s nutritional needs and is a live substance with unique immunological and anti-inflammatory properties that protect against a host of illnesses and diseases for both mothers and children (Lawrence, 1999).

Given that breastfeeding provides optimal nutrition for infants, the AAP encourages all pediatricians to promote and support breastfeeding. It also endorses formal training in breastfeeding and lactation at all levels of medical education; including medical students, residents, fellows, and practicing pediatricians. Despite the recognized need for graduating pediatric residents to have sufficient knowledge and experience in breastfeeding, research shows that very few of them are afforded the much needed training to become practicing pediatricians with the skills to support and promote breastfeeding (Osband, Altman, Patrick, & Edwards, 2011).

OBJECTIVES
To determine if formal breastfeeding education in the form of didactic lectures will improve breastfeeding knowledge and affect attitude toward breastfeeding in pediatric interns. The long-term objective is to improve the health of our community by giving the medical professionals in our area the knowledge, skills, and tools to support breastfeeding prenatally, during infancy, and into early childhood.

METHODS
Pre and post-test interventional pilot study on pediatric interns at Baystate Medical Center. The primary source of information will be from pre and post-tests given before and after didactic breastfeeding education during the Ambulatory 1 rotation. Data collected will measure the change in breastfeeding knowledge and the affect on attitude toward breastfeeding after receiving formal breastfeeding.

RESULTS/OUTCOMES/IMPROVEMENTS
Mean % “correct” attitudes (Q 9-29) were significantly higher post-intervention (18.2) compared to pre-intervention (16.1) (pre - post difference=-2.1, t=-2.5, df=18, p= 0.02). “Correct” response was defined as disagreed or strongly disagreed with the negative statements or agreed or strongly agreed with the positive statements.

Mean % correct knowledge questions (Q30-54) were significantly higher post-intervention (21.4) compared to pre-intervention (16.3) (pre - post difference=-5.1, t=-4.4, df=18, p=0.0003).

SIGNIFICANCE/IMPLICATIONS/RELEVANCE
It was apparent through this interventional clinical research study that interdisciplinary education implemented by a registered nurse lactation consultant made it possible for pediatric interns to gain better attitudes toward breastfeeding and have increased breastfeeding knowledge. This enables the interns to provide better care and improved support to breastfeeding families.

Interdisciplinary health care teams working together, collaborating and communicating closely, optimize patient care. Education on how to best care for breastfeeding families is essential for all healthcare providers who care for new mothers and babies. A condensed version of the PowerPoint lectures were uploaded to the Baystate Medical Center’s Web-based Strategies for Professional Development to be used for the annual validation of breastfeeding competency for all nurses who care for new mothers and infants. This breastfeeding education, provided to all of the nurses and physicians who care for new mothers and infants born at BMC, allows for consistent information provided to patients by the interdisciplinary team.

Presentations
Will be presented at Elms College, Master Degree in Nursing Capstone Presentations, Elms College, MA, April 17, 2012
Exhaust Capnometry and Oximetry During Cardiopulmonary Bypass
Karthik Raghunathan, MD, MPH; Ghassan Aljafar, MD

INTRODUCTION
Membrane oxygenator exhaust capnometry (FexhaustCO2 monitoring) during cardiopulmonary bypass (CPB) has been described previously1-3 while membrane oxygenator exhaust oximetry (FexhaustO2 monitoring) has not. Cerebral oxygen saturation measurement (rSO2) is common during cardiac surgery on CPB and is thought to reflect the regional cerebral oxygen supply-demand balance.4 The feasibility of using FexhaustCO2 monitoring as a guide to optimizing rSO2 has not been investigated previously. Venous oximetry (SvO2), with an optical reflectance transducer applied to CPB circuit tubing, is also common during cardiac surgery and is thought to reflect global whole body oxygen supply-demand balance.5 The feasibility of using the oxygen difference (FinspiredO2- FexhaustO2) as a guide to assessing the adequacy of oxygen uptake from the membrane oxygenator during CPB has not been investigated previously. We examined correlations between FexhaustCO2 and rSO2 and between the oxygen difference and SvO2 during routine CPB.

METHODS
A prospective, correlational, within-subjects design was used. After IRB approval, membrane oxygenator exhaust data were collected in 32 patients undergoing elective cardiac surgery (normothermic to moderate hypothermic CPB). Paired data points were collected simultaneously throughout the study period. We monitored real time in-line venous oxygen saturation (Terumo CD 100 Hematocrit/Saturation monitoring system). This sensor was calibrated against venous blood gas analysis (iSTAT, East Windsor, NJ). The Gish Vision membrane oxygenator was used during the study (Gish Biomedical, Inc.) with a Jostra CPB machine (Hirrlingen, Germany). The Philips M1026B Anesthetic Gas Module system (Andover, MA) was used for exhaust gas analysis. The INVOS regional cerebral oxygen saturation monitoring system (Somanetics, Troy, MI) was used for rSO2 measurements. Plausible global correlations between variables were sequentially examined, as were correlations at different arterial temperature ranges during CPB, using the Pearson product-moment correlation coefficient and Spearman rank correlation coefficient. We specifically examined the relationships between FexhaustCO2, arterial CO2, ‘sweep’ flow rates, and average rSO2. We also examined the relationships between the oxygen difference (FinspiredO2- FexhaustO2), SvO2, CPB pump flow and the hematocrit.

RESULTS
Globally FexhaustCO2 values correlated significantly with arterial CO2 (see graphs). The ‘sweep flow rate’ also correlated significantly with arterial and exhaust CO2 (Pearson r=0.427 and 0.185 respectively), but no significant correlation was found between the FexhaustCO2 and average rSO2. A significant inverse correlation was found between the SvO2 and the oxygen difference (r=-0.19).

CONCLUSION
Fexhaust CO2 and Fexhaust O2 monitoring during CPB is inexpensive and potentially useful. We reconfirmed the utility of Fexhaust CO2 monitoring during CPB and observed correlations with minute sweep rates across the oxygenator. We did not find a significant correlation between the Fexhaust CO2 and average rSO2 measurements despite a plausible physiologic basis. It could be that different models are needed (i.e., time-lagged models, auto-regression within/across patients rather than our simplistic correlation) or that the adjustment for co-variates (such as indexed pump rates) was incomplete, or that a predictable relationship does not exist. The oxygen difference might serve as an inexpensive adjunct to venous oximetry. Exhaust Oximetry and the oxygen difference is easy to measure using standard Airway Gas Monitoring equipment. Further investigations into the utility of exhaust gas monitoring during CPB might focus on analyzing the cost-effectiveness of therapies guided by these analyses.

REFERENCES
5. Artif Organs. 2001;25:890-4

POSTER PRESENTATIONS
Scientific Abstract , American Society of Anesthesiologists, Annual Meeting, Chicago, IL
October 15-19, 2011
Risk Factor Model to Predict a Missed Clinic Appointment in an Urban, Academic and Underserved Setting

Orlando Torres, MD; Owolabi Ogunneye, MD; Jane Garb; Reva Kleppel; Michael Rothberg, MD

BACKGROUND
In the chronic care model setting, a missed clinic appointment (or no-show) decreases continuity, adversely affects scheduling efficiency and can harm quality of care. The aim of this study is to identify the predictors of a missed clinic appointment and to develop a model to effectively predict an individual’s likelihood of missing an appointment.

METHODS
We performed a retrospective study in an urban, academic and underserved outpatient Internal Medicine clinic from January 2008 to June 2011. All new and established patients scheduled with an attending, resident or advanced practitioners were included. The primary endpoint was whether the patient attended or missed the appointment. A missed appointment was defined as a no-show or cancellation within 24 hours of the appointment time. Each patient was included only once, using the most recent appointment. Patient variables included age, gender, marital status, race, zip code, English language proficiency, number of previous visits, and total number of previously missed. The visit variables included provider type, day of the week, time of the day, season and time from booking to actual appointment. The patient population was divided into two randomly selected samples, a test sample (70%) and a validation sample (30%). The test sample was used to generate a logistic model. The validation sample was used to validate the model using the c-statistic and the Hosmer-Lemeshow goodness of fit test.

RESULTS
During the course of 3.5 years, 11,546 patients generated 163,554 encounters. The test population missed an appointment 45% of the time. In the multivariate model, male gender (OR 1.14, 95% CI 1.02, 1.26), provider type (OR resident vs. attending 1.43, 95% CI 1.26, 1.63) and season (OR fall vs. winter 1.25, 95% CI 1.03, 1.51) were all positively associated with a missed appointment. The strongest predictors were percentage of previously missed appointments (OR per 1% increase 1.02, 95% CI 1.02, 1.02), time from booking to actual appointment (OR per day 1.02, 95% CI 1.02, 1.02) and younger age (OR per 1 year decrease 0.98, 95% CI 0.98, 0.98). Non-English Proficiency (OR 0.84, 95% CI 0.74, 0.95) and Day of the week (OR Thursday vs. Monday 0.82, 95% CI 0.70, 0.97) were all negatively associated with a missed appointment. In the validation set, the multivariable model produced deciles of mean predicted risk from 16% to 74%, while the mean observed risk over the same deciles ranged from 14% to 71% (Figure 1). The predicted and observed rates of a missed appointment were 41%. The model showed no gross lack of fit (p = 0.63), and the c-statistic was 0.71

CONCLUSIONS
A simple risk factor model can assist in predicting the likelihood that an individual patient will miss an appointment.

PRESENTATIONS
Poster Presentation, Society of General Internal Medicine, 35th Annual Meeting, May 9-12, 2012, Orlando, FL
The Prevalence of Atypia in Mammogram-Driven Core Biopsies: a Three Year Baystate Experience
Ashita Talsania, MD; Steven Fox, MD; James Stewart, MD; Reva Kleppel; Jennifer Friderici, MS

BACKGROUND
Abnormal screening mammograms are frequently followed by diagnostic core biopsy. Results often include findings of “atypia”, (e.g., atypical ductal hyperplasia, ADH), which may correlate with invasive or non-invasive cancer in subsequent excision in as many as 15% of cases. Such possible upgrade has led to frequent surgical excision after a core biopsy with atypia. The Baystate experience with upgrade on excisional biopsy has not yet been documented. For patient management and education purposes, these data would be useful.

The purpose of this retrospective cohort study was to evaluate image-driven core biopsy and management of “atypia” in women with an abnormal screening mammogram, over a three-year period at Baystate Medical Center.

Methods
A McKesson database provided a list of females aged ≥40 years old billed for core biopsy between 1/1/2007 and 12/31/2009. Demographics, screening mammogram result, needle type and diameter, number of biopsies taken, core pathology results, and excisional biopsy results were abstracted from the CIS electronic record. Descriptive statistics were used to characterize patient demographics and clinical outcomes.

RESULTS
141 patients met inclusion criteria for analysis. The mean/SD age was 54.6/10.3 years. Most core biopsies (93/141 or 66%) were recommended by a radiologist. The median number of biopsy cores was 8.5 (IQR 12, range 1 to 32) and the most frequent needle types documented were 11gauge (57/101 or 56.4%) and 14 gauge (22/101 or 22.0%).

Invasive carcinoma (IC) was found in 13.5% (19/141) of all core biopsies; ductal carcinoma in situ (DCIS) in 7.1% (10/141); and ALH or ADH (without IC or DCIS) in 5.0% (3/141 and 5/141, respectively; 95% CI 1.3%, 8.6%). The odds of any ALH/ADH finding increased by 18% (95% CI 6.2%, 32.7%) with each additional core retrieved.

Of 7 patients whose core biopsies indicated ALH/ADH alone, 5 (71.4%) went on to have an excisional biopsy. Of these patients, none had IC (0/5) or DCIS (0/5).

Conclusions
ALH/ADH is found in 1.3% to 8.6% of image-guided core biopsies. The likelihood of atypia finding increases significantly with number of cores retrieved. A finding of atypia is not associated with IC or DCIS upon excision. Further study in larger samples is required to confirm these findings.
Testing the Feasibility and Complications Involved with Postpartum Placement of the LNG-IUS (Mirena): a Pilot Study
Amber Truehart, MD; Katharine White, MD

BACKGROUND
Half of all pregnancies in the United States are unplanned. The intrauterine device (IUD) is an often-overlooked and highly effective long-term method of contraception. While studies have shown that postpartum women are interested in IUDs, only approximately half of these women obtain an IUD. Many women do not keep their postpartum appointments or may already be pregnant by the time of follow-up. Postpartum IUD insertion allows immediate start of contraception that is in place at discharge. Recent literature surrounding postpartum placement of IUDs is limited.

OBJECTIVES
We assessed the feasibility and complications involved with postpartum placement of the levonorgestrel intrauterine system (LNG-IUS).

METHODS
We conducted a prospective cohort study at Baystate Medical Center beginning in January 2011. We enrolled 150 women age 18-40 years at a prenatal visit at the Wesson Women’s Clinic. Participants chose to have a postpartum LNG-IUS (n=75) or another form of birth control (n=75). Women enrolled in the IUD arm were given a prescription for the LNG-IUS to bring with them to the hospital at the time of their delivery. LNG-IUS were placed immediately at the time of vaginal or cesarean delivery or within the first 48 hours; ultrasound guidance was used for placements not performed at cesarean delivery. Residents completed questionnaires regarding the insertion process. We collected participant data at enrollment and during four follow up telephone calls. The primary outcome was feasibility of placement (both resident challenges and participant eligibility) and identifications of barriers. The secondary outcomes were participant satisfaction and complications.

RESULTS
Most participants (58/75, 78%) in the IUD arm received a post-partum IUD; common reasons for non-placement included chorioamnionitis (n=4) and participant leaving the IUD at home or changing her mind (n=6). Residents had minimal difficulty obtaining equipment needed for insertion. The most common reason (55%) for delayed insertion was unavailability of the IUD. Residents reported insertion of IUD was not difficult or a little difficult 94% of the time for immediate and 77% for delayed insertion (p=.14). Insertion took an average of 5.5 minutes (SD 4.3). Participants thought the insertion process was very (77%) or somewhat (10%) acceptable. Expulsion rate in the first 6 months was 5% (n=3) and removal rate was 16% (n=9). Common reasons for removal were pain (n=2), bleeding (n=2) and weight gain (n=3). One IUD was expelled during the patient’s hospitalization; there were no other complications. Overall, subjects were very (82%) or somewhat (11%) satisfied with the IUD and 74% planned to use the IUD for 5 years (n=32).

IMPLICATIONS
In this study, most women who wanted IUD placement postpartum and who did not develop medical contraindications during labor had successful LNG-IUS insertion. IUD availability on the inpatient hospital formulary has the potential to increase uptake of this contraceptive method. Women who received a postpartum LNG-IUS had low expulsion rates and high satisfaction both with the insertion process and the LNG-IUS as a form of birth control. Based on these results the LNG-IUS should be offered to all patients as a postpartum birth control option.
C-Kit Protein Expression in Female Lower Genital Tract Melanoma

Carlos Prieto-Granada, MD; Namrata Setia, MD; Jane Garb, MS; Wayne Duke, MD; Jean Henneberry, MD

BACKGROUND
Vulvar and vaginal melanomas represent 37.1% and 7.4% of the mucosal melanomas respectively. C-Kit is a tyrosine kinase receptor altered in up to 40% of mucosal melanomas. Tyrosine kinase inhibitors (TKI) are effective in mucosal melanomas harboring specific KIT gene mutations. An association between mutated KIT and expression of C-Kit by immunohistochemistry (IHC) has been suggested. Our study explores C-Kit IHC expression in vulvovaginal melanomas and its correlation with prognostic factors.

DESIGN
Formalin-fixed paraffin-embedded tissue blocks of vulvovaginal melanomas from 23 patients diagnosed between 1987 and 2009 were retrieved from our files. Demographic, anatomic location and prognostic data were recorded. Protein expression was semi-quantitatively scored in sections immunostained with C-Kit (DAKO 1:1000) assessing staining percentage (<20%:1+, 20-50%:2+, >50%:3+) and intensity (0 to 3+) with a cumulative score ranging from 0 to 6 (0-2 negative, 3 borderline, 4-6 positive). The data was subjected to multiple regression analysis considering known melanoma prognostic factors.

RESULTS
The age ranged from 44 to 90 years old (mean 70.8 n=23). Sixteen tumors were vulvar (70%) with 14 labial and 2 clitoral. Seven tumors (30%) were vaginal. The tumors were bulky (mean thickness of 6.12 mm.) with 17 (72%) level IV lesions. Ulceration was present in 15 (65%) tumors and mitotic activity was brisk (mean mitotic count 5.4 per mm2). Lymphovascular invasion (LVI) was found in 5 (22%) cases. Scoring of IHC slides yielded 3 negative, 5 borderline and 15 positive cases (mean cumulative score 4.3). Positive/borderline cases (97% n=20) were composed of four cases staining only the melanoma in-situ component and 17 cases staining the invasive component (only in RGP: 2 cases, VGP:14 cases). Multiple regression analysis revealed that C-Kit expression was significantly lower in level IV lesions compared to level II-III lesions (p=0.014) after adjusting for other significant factors. Presence of LVI further decreased C-Kit score by 2.3 (p=0.001). This data confirms that of previous studies in melanomas from other anatomical sites regarding relative loss of C-Kit expression with progression of disease.

CONCLUSION
We found that a great proportion (97%) of our 23 cases of female genital tract melanomas expressed C-Kit protein by IHC and that it was comparatively diminished with disease progression. In our opinion, although tempting, the association between C-Kit expression and TKI-sensitive KIT mutations in melanomas should be confirmed with genetic analysis.

Presentations
2012 United States & Canadian Academy of Pathology Annual Meeting - Poster
A Predictive Model for Preterm Infants to Target Indomethacin Therapy for Prevention of Intraventricular Hemorrhage

Sam Gorstein, MD; Paul Visintainer, PhD; Frank Bednarek, MD; Joseph Chou, MD, PhD; Elisabeth McGowan, MD; Rachana Singh, MD, MS

BACKGROUND
Severe intraventricular hemorrhage (SIVH) has an incidence of 3-12% in very low birth weight infants (VLBW). Prophylactic indomethacin decreases the incidence of SIVH and reduces white matter injury. It may cause transient impairment of renal and platelet function with potential gastrointestinal complications. Identifying high risk infants may help target therapy to those most likely to benefit.

OBJECTIVE
Develop a predictive model for SIVH using data available by 6 hours of age, to allow early identification of VLBW infants most likely to benefit from prophylactic low-dose indomethacin therapy.

DESIGN/METHODS
A cohort of VLBW infants with gestational age between 23 and 32 weeks (N = 2917) from 4 level III NICUs between 2000 to 2010 was abstracted from the Vermont Oxford Network database to develop this model. Infants with any exposure to indomethacin or ibuprofen therapy, congenital anomalies or chromosomal syndromes were excluded. Data included gestational age, antenatal steroids, mode and location of delivery, gender, birth weight, 5 minute Apgar score and admission temperature. Logistic regression was performed from all combinations of any 3 NICUs to develop the model which was then validated on data from the remaining center. After validation, data from all 4 NICUs was used to develop the final model.

RESULTS
ROC area of the predictive model using all four datasets was 0.85 (95% CI: 0.81- 0.88). Gestational age, antenatal steroids, location of birth and 5 minute Apgar score were significantly associated with SIVH (p < 0.05). Birth weight and admission temperature did not reach statistical significance.

CONCLUSIONS
We have developed a statistically valid model for predicting the risk of SIVH usable within the first 6 hours of life which may help identify infants most likely to benefit from prophylactic indomethacin therapy. Future studies will utilize the model to target indomethacin therapy and assess neurodevelopmental outcomes.

PRESENTATIONS
2012 Eastern Society for Pediatric Research Annual Meeting, PA
Oral Presentation (Platform Presentation) March 2012
Pediatric Academic Societies’ Annual Meeting, MA
Poster Symposium (Poster + Platform) April 2012
Racial and Insurance Disparities in Metabolic Control and Pump Starts for T1DM Children within Two Years of Diagnosis

Thomas Wadzinski, MD, PhD; Ksenia Tonyushkina, MD; Chris Jasinski, MBA; Paul Visintainer, PhD; Holley Allen, MD

BACKGROUND
Health outcome disparities including timeliness of diagnosis and metabolic control (A1C) in T1DM children are associated with race and insurance type (public vs private). Continuous subcutaneous insulin infusion (CSII) or pump therapy is suggested to improve A1C more than multiple daily injections (MDI) independent of race. Disparities in CSII usage between races have also been reported but information as to how and when these differences develop is lacking.

OBJECTIVES
To assess the effect of race, insurance type (public vs private), and insulin therapy (CSII vs MDI) on A1C in newly diagnosed T1DM children.

METHODS
An IRB approved retrospective chart review of 247 patients (139 males) newly diagnosed with T1DM at 10+/−4.1 (SD) yrs of age and followed at an academic tertiary health care center for 1 to 2 yrs yielded data on race, insurance type, insulin regimen, and A1C at the time of diagnosis and 6, 12 and 24 months after. Chi-squared testing was used to detect relationships between individual variables. Logistic regression (LR) analysis was performed to identify factors associated with CSII therapy or A1C levels at 1 and 2 yrs after diagnosis. Multiple LR analysis evaluated effects on A1C over time.

RESULTS
17% of children had transitioned to CSII by 1 yr from diagnosis, and 34% by 2 yrs. There was a clear difference in CSII use between ethnic groups and insurance types at 2 yrs (p<0.001): 18% of Hispanics (8/45); 41% of Whites (73/179), and no African-Americans (0/16). For insurance type at 2 years: 19% of public (18/93) vs 43% of private (63/147) insurance were on CSII. At 2 yrs LR analysis showed that Whites had lower A1Cs than Hispanics (-0.9%, p<0.001), patients with private vs public insurance (-0.6%, p=0.004), and patients on CSII vs MDI therapy (-0.4%, p=0.049). CSII was associated with lower A1C level independent of race or insurance. Differences in A1C with race and insurance type were found as early as 6 months after diagnosis, where differences with CSII therapy were not seen until 2 yrs.

SIGNIFICANCE
In this newly diagnosed population, ethnic and insurance disparities were strong predictors of metabolic control as well as use of CSII. CSII was associated with better metabolic control at 2 yrs post diagnosis regardless of race. Further studies are needed to elucidate barriers to CSII and metabolic control in Hispanic and African American children with T1DM.

PRESENTATIONS
Poster at Pediatric Academic Society 2012 Meeting 4/2012
Presentation at Eastern Society for Pediatric Research 2012 Meeting 3/2012
There Will Be Blood: Imaging Appearance of Blood and Blood Products—
A Multimodality Review
Jonathan Cogley, MD; Peter Ghobrial, MD; Dmitry Rakita, MD; Khaldoon Al-Dulaimy, MD

A pictorial review of the appearance of blood and blood products on ultrasonography, MRI, and CT. The viewer will come away with a better understanding of the complexities of blood product aging and how this contributes to its diagnostic imaging appearance.

PRESENTATIONS:
Laparoscopic Implantation of Gastric Stimulator as an Effective Treatment Modality for Gastroparesis

David Earle, MD; Lee Farber, DO

BACKGROUND
Gastroparesis is a motility disorder of the stomach characterized by delayed passage of liquid and/or food boluses without a widely accepted effective treatment thus far.

OBJECTIVES
Our aim is to evaluate the effectiveness of an implantable gastric electrical stimulator device (Enterra®; Medtronic; Minneapolis, MN) in patients with diabetic or idiopathic Gastroparesis as measured by subjective patient responses comparing pre- and postoperative quality of life in terms of the percentage improvement in their gastroparesis related symptoms such as nausea, vomiting, abdominal pain, frequent admissions to hospital for dehydration, weight loss, and poor glucose control due to erratic dietary intake.

METHODS
Retrospective review of 23 patients who underwent laparoscopic implantation of gastric stimulator for gastroparesis between 2005 and 2011. Inclusion criteria were symptoms consistent with gastroparesis, abnormal nuclear medicine gastric emptying and no evidence of an anatomic gastric outlet obstruction. All patients underwent laparoscopic implantation of the device with simultaneous upper endoscopy. Two leads were secured parallel to each other 10cm proximal to the pylorus along the greater curvature of the stomach. All cases were successful, and had the stimulator turned on at the end of the case. Retrospective analysis of patient responses concerning their percentage improvement over preoperative was analyzed. Demographic information, known complications and those lost to follow-up were also recorded.

RESULTS/OUTCOMES/IMPROVEMENTS
Four patients were lost to follow-up postoperatively and one patient required excision due to infection. Another patient also developed an infected fluid collection around the implant, and this was treated without removal. After accounting for these patients, final review accounted for 18 patients, male (n=7) and female (n=11), ranging in age from 22 to 69 years old (mean age 47.33 years). Out of the 18 patients included in the final case analysis, 61% had a documented diagnosis of Diabetes Mellitus with an operative diagnosis of Diabetic Gastroparesis, while the remainder were idiopathic. The most common subjective preoperative complaints were vomiting (n=17), nausea (n=16), symptoms refractory to medical management (n=16), previous hospital admission(s) as a direct result of gastroparesis (n=12), abdominal pain (n=11), unintentional weight loss (n=11), and early satiety (n=3). All patients had a preoperative Nuclear Medicine Gastric Emptying Study performed which yielded a positive result for decreased gastric emptying consistent with the diagnosis of gastroparesis. 78.3% of patients followed up for a mean of 22.2 months (range 2 weeks to 6 years). Post operatively, patients were evaluated in the office setting and asked subjectively how much they were improved from baseline concerning their overall quality of life. Improvement ranged from return to baseline to 100% improvement. On initial postoperative visit, 14 of 18 patients (77%) gave a percentage to quantify their improvement; 6/14 (43%) were 10% to 30% improved, 4/14 (28.5%) were 35% to 75% improved, and 4/14 (28.5%) were 80% to 100% improved. For those who did not quantify their improvement, reflective responses were “no vomiting since surgery,” “better than preop, less nausea, no vomiting,” “major improvement,” “very well.” Approximately 16 of 18 (88.9%) patients followed up on subsequent office visits beyond their initial postoperative visit, of which 100% (16/16) quantified their subjective improvement from baseline. One patient was 10% improved, 4 that were 50% to 70% improved, 9 that were 80 to 100% improved. Two patients overall (2/18, 11%) concluded that at their follow-up, they were just as they were prior to the stimulator being placed and 6 patients (6/16, 37.5%) showed a decrease over time of the effectiveness of the stimulator (% decrease range 5% to 90%, mean decrease 42.5%). The mean overall improvement over baseline from those who quantified their satisfaction with the procedure was 62.2%, with a median of 75% overall improvement.

CONCLUSIONS
GES implantation effectively relieves symptoms related to gastroparesis in patients with both idiopathic and diabetic gastroparesis with abnormal nuclear medicine gastric emptying studies. The results vary, but generally met the goals and objectives of the patient. This modality should probably be considered in all medically refractory patients with symptomatic gastroparesis.

PRESENTATIONS
Paper accepted: Society of American Gastrointestinal and Endoscopic Surgeons [SAGES], Presenter: LEE A FARBER, DO
Session Number: Poster
Session Name: Poster Presentations
Session Date: Thursday - Saturday, March 8 - 10, 2012
Risk Assessment of Early Venous Thromboembolic Prophylaxis in Head-Injured Patients
Melissa Cloonan, MD; Romie Mundy, MD; Scott Sinelli, DO; Reginald Alouidor, MD;
Lisa Patterson, MD; Ronald Gross, MD

BACKGROUND
The trauma patient population is known to be at increased risk for venous thromboembolic (VTE) complications and early chemical VTE prophylaxis is thought to decrease this risk. Unfortunately, patients with intracranial hemorrhage frequently do not receive chemical prophylaxis due to the perceived threat of ongoing bleeding. Recent studies have shown that DVT prophylaxis can be instituted as early as 48 hours after injury. Our institution’s VTE protocol aims to start chemical prophylaxis within the first 24 hours. The goal of this study was to review how our protocol affected VTE prophylaxis rates and complications related to thrombosis and bleeding in head injured patients.

METHODS
Trauma registry and medical records were reviewed for patients with brain injury between 2007 and 2010 before and after the initiation of our trauma VTE prophylaxis protocol. Comparison was based on demographics, comorbidities, length of hospitalization, previous anticoagulation, time to VTE prophylaxis, severity and type of injury as defined by imaging and Glasgow Coma Score and Injury Severity Score. Progression of bleeding was identified by chart review looking for changes in exam, GCS and imaging as well as subsequent interventions. Patients with CT verified intracranial injury were reviewed and those who died or were discharged in < 24 hours were excluded. Endpoints were time to VTE prophylaxis, thromboembolic complications, and bleeding complications. Analyses were by T-test for means and chi square for group comparisons with significance set at p=0.05.

RESULTS
Registry review identified 478 patients, all of whom were included in this analysis (207 pre-protocol, 271 post-protocol). The groups were similar for gender, age, hospitalization length, prior anticoagulation, injury severity, and neurological status. Though times to chemical prophylaxis were equivalent (pre-24+/- 41hr, post-18 +/-24hr; p<0.97), more patients received chemical prophylaxis in the post-protocol group (57% vs 75%, p=0.00002). One deep vein thrombosis and one pulmonary embolus was identified in each group. All VTE events were associated with polytrauma and/or prophylaxis initiated >80hrs. Incidence Intra- and extra-cranial bleeding complications were not correlated with increased use of chemical prophylaxis.

CONCLUSION
Our protocol resulted in more consistent use of VTE prophylaxis as compared to pre-protocol head injury patients. Chemical VTE prophylaxis initiated within the first 24 hours is safe with no increase in bleeding complications.

PRESENTATIONS
Massachusetts Committee on Trauma, Poster presentation, Boston, MA 10/31/11