October 23, 2015

Russell House
University of South Carolina
Columbia, SC

Established and coordinated by the
Department of Obstetrics and Gynecology
University of South Carolina School of Medicine
Welcome!

We are pleased that you are joining us for the 2015 Carolina Women’s Health Research Forum. We want to acknowledge the expertise of faculty from other departments, schools, and colleges at USC and Palmetto Health who have collaborated with us to present this ninth annual research forum. Please take a moment to review the members of the Forum Steering and Scientific Committees.

Today’s morning session will focus on women’s health as impacted by the environment. Medical University of South Carolina Professor Demetri D. Spyropoulos, Ph.D., will provide an engaging keynote presentation entitled *Empowering Awareness of Environmental Impacts on Women’s Health – from Wildlife and Stem Cells to the Clinic and Personal Choices*. A follow-up panel discussion will address environmental influences on the health of women with time for audience questions and answers. The Forum will be moderated by Suzanne McDermott, Ph.D. Panelists include Holly A. LaVoie, Ph.D., Dwayne E. Porter, Ph.D., and Sarah E. Rothenberg, D.Env.

A midday poster session will feature research abstracts related to multiple aspects of women’s health submitted by researchers and health professionals in multiple disciplines and from institutions across our state. A light lunch will be served. The afternoon session will feature selected oral presentations by Palmetto Health / USC School of Medicine OB/GYN resident physicians and by 2015 Carolina Women’s Health Research Forum poster award winners.

This forum should provide you with ample opportunities for networking. We sincerely hope the forum will be productive for participants, informative for attendees, and valuable for the scientific community at large. Quality research will ultimately benefit the women of South Carolina.

Please take a few minutes to complete the SurveyMonkey evaluation that will be emailed to you. We value your input and will use your feedback as we plan for future Women’s Health Research Forums.

Thank you.

*Judith T. Burgis, M.D.*
Forum Chair  
Professor and Chair  
Department of Obstetrics and Gynecology  
USC School of Medicine

*Stanette L. Brown, R.N.*
Forum Coordinator  
Department of Obstetrics and Gynecology  
USC School of Medicine
Forum Steering Committee

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    Forum Chair
    Professor and Chair, Obstetrics and Gynecology
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    Assistant Professor, Environmental Health Sciences
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Special Acknowledgements

The Forum Steering and Scientific Committees wish to acknowledge financial support provided for the 2015 Carolina Women’s Health Research Forum by:

South Carolina Medical Translational Technology Program
Support for Education and Outreach Activities

We wish to acknowledge the support of the University of South Carolina School of Medicine in providing poster display stands for the Forum poster session.
Schedule of Events

7:30 – 8:30 a.m.  Poster hanging, Russell House Ballroom
                 Registration, Russell House Theater

8:45 a.m.        Welcome and Opening Remarks
                 Judith T. Burgis, M.D.
                 Forum Chair
                 Professor and Chair, Obstetrics and Gynecology
                 USC School of Medicine

9:00 – 10:00 a.m. Keynote Presentation
                  Empowering Awareness of Environmental Impacts on Women’s Health –
                  From Wildlife and Stem Cells to the Clinic and Personal Choices
                  Demetri D. Spyropoulos, Ph.D.
                  Professor, Department of Pathology & Laboratory Medicine
                  Medical University of South Carolina, Charleston, SC

10:00 – 10:15 a.m. Break

10:15 – 11:00 a.m. Poster Session – Part 1

11:00 – 12:15 p.m. Panel Discussion
                  Environmental Influences on Women's Health
                  Moderator:
                  Suzanne McDermott, Ph.D.
                  Professor, Epidemiology and Biostatistics
                  Director, Disability Research and Dissemination Center
                  University of South Carolina Arnold School of Public Health
                  Panelists:
                  Holly A. LaVoie, Ph.D.
                  Professor, Cell Biology & Anatomy
                  University of South Carolina School of Medicine
                  Dwayne E. Porter, Ph.D.
                  Associate Professor and Director of Graduate Studies
                  Environmental Health Sciences
                  University of South Carolina Arnold School of Public Health
                  and the Baruch Institute for Marine and Coastal Sciences
                  Sarah E. Rothenberg, D.Env.
                  Assistant Professor, Environmental Health Sciences
                  University of South Carolina Arnold School of Public Health

12:15 – 1:00 p.m. Poster Session – Part 2

1:00 – 1:45 p.m. Networking Lunch
1:45 – 2:45 p.m. Oral Presentations by OBGYN Residents

Results of a Perinatal Education Survey
Jill M. Johnson, D.O.
OBGYN Resident, PGY 4
Palmetto Health/University of South Carolina School of Medicine

The Impact of Centering Pregnancy™ Group Prenatal Care on Patient Satisfaction
Callie C. Meeks, M.D.
OBGYN Resident, PGY 4
Palmetto Health/University of South Carolina School of Medicine

An Evaluation of Obstetrics and Gynecology Resident Clinic from Residents’ and Program Directors’ Perspectives
Zachary Tyser, M.D.
OBGYN Resident, PGY 3
Palmetto Health/University of South Carolina School of Medicine

Attitudes and Practice Patterns Regarding Trial of Labor after Cesarean Delivery
Fran Bailey, M.D.
OBGYN Resident, PGY 3
Palmetto Health/University of South Carolina School of Medicine

Retrospective Review of Prophylactic Salpingectomy at Palmetto Health Richland: Evaluation of Rates and Perioperative Complications
Kristin Bell, D.O.
OBGYN Resident, PGY 3
Palmetto Health/University of South Carolina School of Medicine

Application of the Vaginal Birth after Cesarean Calculator to Evaluate Outcomes of Trial of Labor after Cesarean at Palmetto Health Richland Hospital: A Retrospective Review
Vindhya Subramanyam, M.D.
OBGYN Resident, PGY 4
Palmetto Health/University of South Carolina School of Medicine

2:45 – 3:15 pm Oral Presentations by 2015 Poster Award Winners

Best Student Poster
Using Synthetic Lectins to Investigate Metastatic Potential in Colon Cancer
Erin E. Gatrone, Ph.D. candidate
University of South Carolina Department of Chemistry and Biochemistry

Best Basic Science Poster
Metformin Impairs RHO GTPase Signaling and Inhibits the Survival and Migration of Neuroblastoma Cells
Ambrish Kumar, Ph.D.
Postdoctoral Fellow, USC School of Medicine, Department of Pathology, Microbiology, and Immunology
Best Clinical Science Poster
*Morphometric Analysis of the Pediatric Cervical Spine*
Kyle T. Johnson, B.S.
MD candidate
University of South Carolina School of Medicine

Best Social Science Poster
*Rural-Urban Differences in Medicare Service Use among Women in the Last Six Months of Life*
Elizabeth L. Crouch, Ph.D.
Research Assistant Professor
Department of Health Services Policy & Management
University of South Carolina
South Carolina Rural Health Research Center

3:15 p.m. Summary and Closing Remarks
*Judith T. Burgis, M.D.*
Adams RD, Maillé N, and Osol G. EFFECTS OF DIRECT STIMULATION OF THE CGMP/PKG SIGNALING PATHWAY VERSUS ANTIHYPERTENSIVE TREATMENT ON THE UTERINE VASCULATURE IN PREGNANT, NO-INHIBITED RATS

Anderson EL, Banister CE, Kassler S, Messersmith A, Pirisi-Creek L, Wyatt MD, and Creek KE. CpG METHYLATION OF HPV16 L2 IN A COHORT OF COLLEGE-AGE WOMEN

Bailey F, Cai B, and Brooks C. ATTITUDES AND PRACTICE PATTERNS REGARDING TRIAL OF LABOR AFTER CESAREAN DELIVERY

Banister, Pirisi L, Creek K, and Buckhaults PJ. INTEGRATED GENOMIC ANALYSIS IDENTIFIES A NEW CATEGORY OF CERVICAL CANCER

Bell K, Finney C, Kats B, and Jackson A. RETROSPECTIVE REVIEW OF PROPHYLACTIC BILATERAL SALPINGECTOMY (BS) AT PALMETTO HEALTH RICHLAND: EVALUATION OF RATES AND PERIOPERATIVE COMPLICATIONS

Blanco C, Doster M, Rosa A, Neal A and Holland AK. SEX DIFFERENCES IN REGULATION OF SYMPATHETIC TONE AND NEUROPSYCHOLOGICAL TASK PERFORMANCE REQUIRING SELECTIVE ACTIVATION OF THE LEFT FRONTAL LOBE

Burton T, Walters A, Childes B, and Chu C. TRIPLE NEGATIVE BREAST CANCER IN THE PALMETTO HEALTH BREAST CANCER DATA BASE: a PRIMARY COMPARISON OF RACE WITH SUBSET COMPARISONS OF TUMOR TYPE, NODE STATUS, AJCC STAGE, AGE, AND MORTALITY OUTCOMES. FOLLOWED BY AN OVERALL COMPARISON TO THE SEERS NATIONAL DATA BANK

Corso M, Kordus R, Whitman-Elia G, and LaVoie HA. CUMULUS CELL MARKERS OF OOCYTE QUALITY

Crouch EL, Bennett KJ, and Probst JC. RURAL-URBAN DIFFERENCES IN MEDICARE SERVICE USE AMONG WOMEN IN THE LAST SIX MONTHS OF LIFE

Donohue A, McGuire J, and Rothenberg S. METHYLMERCURY PARTIONING IN MALI RICE

English SJ and Wright SS. THE CIRCLE GAME: THE EFFECTS OF CONTINUAL CHANGE & GRIEF AMONG WORKERS IN LONG TERM CARE
Farmaki E, Chatzistamou I, Kaza V, and Kiaris H. A CCL8 GRADIENT DRIVES BREAST CANCER METASTASIS

Finney C and Sims K. CASE REPORT: ETONOGESTREL SUBDERMAL IMPLANT FAILURE IN TWO PATIENTS

Fishburne TE, Billings D, and Ingram LA. CHOOSE WELL: A MOVEMENT TO INCREASE CONTRACEPTIVE ACCESS IN SOUTH CAROLINA

Foster RR and Messersmith AR. CHARACTERIZATION OF LYMPHOCYTES IN THE CERVICAL MUCOSA

Gatrone EE, O'Connell K, Veldkamp AA, and Lavigne JJ. USING SYNTHETIC LECTINS TO INVESTIGATE METASTATIC POTENTIAL IN COLON CANCER

Hardeman S and Srinivasan S. SBIRT: EVIDENCE-BASED STRATEGIES TO EMPOWER HEALTH PROFESSIONALS ADDRESSING SUBSTANCE USE

Hayne PD, Heiney SP, Gullatte M, Powe B, and Habing B. FATALISM REVISITED: FUTHER PSYCHOMETRIC TESTING ACROSS TWO SAMPLES

Heberlein EC, Billings D, Mattison Faye AC. LARC HOSPITAL TOOLKIT

Hrisko S, Dalal I, Getz1 A, Durkin MW, and Payne RA. ATTITUDES AND PERCEPTIONS REGARDING MARIJUANA AND MEDICAL MARIJUANA AMONG FOURTH YEAR MEDICAL STUDENTS IN THE UNITED STATES

Hundal T, O'Connell K, and Lavigne JJ. DESIGN AND ACTIVITY RELATIONSHIPS OF SYNTHETIC LECTINS TOWARDS AN IMPROVED DIAGNOSIS AGAINST COLORECTAL CANCER

Hynes AM and Tate A.A CROSS-SECTIONAL STUDY OF THE IMPACT TO COMMUNITIES WHEN BREAST CANCER EDUCATION IS INTRODUCED TO THE MEDICALLY UNDERSERVED: THE ICBrCaEd STUDY

Johnson J, Claire J, Cai B, and Brooks C. RESULTS OF A PERINATAL EDUCATION SURVEY

Johnson KT, Al-Holou WN, Anderson RC, Garton HJ, and Maher CO. MORPHOMETRIC ANALYSIS OF THE PEDIATRIC CERVICAL SPINE

Jones R and French J. PRESENCE OF BLEEDING DISORDERS AND MENORRHAGIA IN A HEMOPHILIA CENTER POPULATION

Kumar A, DiPette DJ, and Singh US. METFORMIN IMPAIRS RHO GTPASE SIGNALING AND INHIBITS THE SURVIVAL AND MIGRATION OF NEUROBLASTOMA CELLS
Lynes C and Schneider L. USING BRFSS DATA TO ASSESS BREAST AND CERVICAL CANCER SCREENING AT VARIOUS GEOGRAPHIC LEVELS IN SOUTH CAROLINA

McDermott M, Ivers L, O'Donovan N, Crown J, Roninson I, and Broude EV. OVERCOMING RESISTANCE TO HER2-TARGETING DRUGS USING CDK8 INHIBITORS

Meeks C, Claire J, Cai B, and Burgis JT. THE IMPACT OF CENTERING PREGNANCY™ GROUP PRENATAL CARE ON PATIENT SATISFACTION

Mulatya CM, Samson M, and Swann AA. BREAST CANCER AND ALL-CAUSE MORTALITY AMONG ECONOMICALLY DISADVANTAGED WOMEN AGED 47 TO 64 YEARS: COMPETING RISK ANALYSIS AND COX PROPORTIONAL HAZARDS MODEL

Oner C, Nguyen KV, and Mandal KC. NEW SOLID-STATE 4H-SiC X-RAY DETECTOR FOR HIGH RESOLUTION DIGITAL MAMMOGRAPHY

Penta K, Woodruff J, Perez A, and Nyland J. EFFECT OF ARSENIC ON TYPE 2 DIABETES


Reilly NM, Marone MG, Adedokun DO, Yard BD, and Pittman DL. ENHANCING CANCER CHEMOSENSITIVITY BY TARGETING THE RAD51D OVARIAN CANCER SUSCEPTIBILITY GENE

Rodriguez C, Hilfinger Messias DK, Meetze EG, M., Fore ME. THE IMPACT OF NAVEGANTES PARA SALUD ON ACCESS TO PRIMARY CARE AMONG HISPANIC WOMEN AND CHILDREN

Rosa A, Blanco C, Doster M, Neal A and Holland AK. HIGH HOSTILE WOMEN EVIDENCE DIMINISHED CAPACITY TO PROCESS COGNITIVE STRESS WHEN COMPARED TO LOW HOSTILE WOMEN

Samson M and Adams SA. TRENDS IN ORAL CONTRACEPTIVE USE BY RACE AND ETHNICITY IN SOUTH CAROLINA AMONG MEDICAID-ENROLLED WOMEN

Saum AFL, Hetzler KL, Reszczynski O, and Carson J. THE EFFECT OF OVARIAN FUNCTION ON INTERLEUKIN-6 REGULATION OF CACHEXIA-INDUCED MUSCLE WASTING IN TUMOR BEARING MICE

Subramanyam V, Richmond-Mart A, Baker A, Cai B, and Burgis JT. APPLICATION OF THE VAGINAL BIRTH AFTER CESAREAN CALCULATOR TO EVALUATE OUTCOMES OF TRIAL OF LABOR AFTER CESAREAN AT PALMETTO HEALTH RICHLAND HOSPITAL: A RETROSPECTIVE REVIEW
Tyser Z, Cai B, and Sims K. AN EVALUATION OF OBSTETRICS AND GYNECOLOGY RESIDENT CLINIC FROM RESIDENTS’ AND PROGRAM DIRECTORS’ PERSPECTIVES

Ware JO, Farrell C, Pedigo N. UPREGULATION OF CANCER GENES IN BREAST TUMORS WITH FACIODIGITOGENITAL DYSPLASIA 1 (FGD1) EXPRESSION

Webb LA, McDonnell KK, Hilfinger Messias DK. NOT A DEATH SENTENCE: PERSPECTIVES OF AFRICAN-AMERICAN WOMEN LIVING WITH LUNG CANCER

Wood CB, Murday D, Srinivasan S, Hardeman S, and Payne R. DOES GENDER INFLUENCE TRAINEE CONFIDENCE IN THEIR ABILITY TO PERFORM SBIRT SKILLS?
ABSTRACTS
EFFECTS OF DIRECT STIMULATION OF THE CGMP/PKG SIGNALING PATHWAY VERSUS ANTIHYPERTENSIVE TREATMENT ON THE UTERINE VASCULATURE IN PREGNANT, NO-INHIBITED RATS

Richard D. Adams, MD, Nicole Maille, BS, and George Osol, PhD
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University of Vermont, Burlington, VT

Background: The physiological stress of pregnancy on the maternal systemic and uterine vascular systems demands significant vascular remodeling to adapt to the increased blood volume and uteroplacental blood flow. Nitric Oxide (NO) is a key signaling molecule necessary for normal vascular remodeling, while inhibition of NO attenuates the remodeling process. Evidence exists for NO to mediate effects by mechanisms other than the canonical sGC-cGMP-PKG pathway. The primary goal was to determine whether treatment with a NO-independent stimulator of soluble Guanylate Cyclase (sGC) could re-institute the cGMP-PKG pathway, reverse hypertension, and restore vascular remodeling in NO-inhibited rats. The secondary goal was to determine whether vascular remodeling could be restored by treatment with an antihypertensive alone. The tertiary goal was to evaluate vessel reactivity when exposed to a potent NO donor.

Methods: Pregnant Sprague-Dawley rats were treated with L-NAME (NOS inhibitor) or co-treated with either BAY41-2272 (sGC stimulator) or Diltiazem (antihypertensive) during the second half of gestation. Measurements taken included mean arterial pressure (MAP) at mid-gestation as well as main uterine artery (MUA) and arcuate artery diameters, and pup & placenta weights upon sacrifice of the animal on Day 20 for the following groups: Control (C:n=11), L-NAME (L:n=14), L-NAME+BAY (LB:n=9), and L-NAME+DILT (LD:n=9) treated rats. Arcuate arteries were dissected, mounted on an arteriograph in a physiologic solution, and treated with DETA/NO (NO donor) in a dose-response fashion to evaluate vessel reactivity.

Results: Co-treatment with BAY41-2272 prevented the development of hypertension (C: 96 ± 5.4 mmHg; L: 129±2.8 mmHg; L+B: 94±2.4 mmHg; L+D: 96±2.9 mmHg p<0.05) and fully restored MUA remodeling (C: 228±10 µm; L: 172±12 µm; L+B: 222 ± 7 µm) while BP control with Diltiazem normalized BP but not remodeling (L+D:170±12 µm; p<0.05). A similar pattern was seen with arcuate artery remodeling, and no between-group differences in pup/placental weights. The L-NAME and L+D vessels showed increased sensitivity to NO compared to controls (EC50 values: L: 11.6±5.2 µM; L+D: 6.3 ± 2.1 µM; C: 34.9±3.6 µM), while the L+B showed an intermediate response (EC50 values: L+B: 16.4±7.2 µM).

Conclusion: In summary, NO signaling via the sGC/PKG pathway is essential for normal uterine vascular adaptation in pregnancy.
CpG METHYLATION OF HPV16 L2 IN A COHORT OF COLLEGE-AGE WOMEN
Erin L. Anderson1, Carolyn E. Banister1, Susanna Kassler1, Amy Messersmith1,2, Lucia Pirisi-Creek3, Michael D. Wyatt1, Kim E. Creek1

1Department of Drug Discovery and Biomedical Sciences, South Carolina College of Pharmacy, University of South Carolina, 2Department of Pharmaceutical Sciences, College of Pharmacy, Presbyterian College, 3Department of Pathology, Microbiology and Immunology, School of Medicine, University of South Carolina

Abstract

Background and Significance: It is unknown why HPV infections clear in most women yet persist in others. Women with persistent high-risk HPV (HR-HPV) infection are at the greatest risk of cervical dysplasia and cervical cancer. There is a clinical need to identify biomarkers that are predictive of the small number of HR-HPV infections that will persist. In the Carolina Women’s Care Study (CWCS) at the University of South Carolina we followed a cohort of 467 freshman women over four years of college with the goal of identifying biomarkers of HPV persistence.

Methods: DNA from exfoliated cervical cells was collected in biannual visits, which allowed for the identification of participants who rapidly cleared HPV infections along with others who had persistent infections. We hypothesized that alterations in the methylation status of HPV DNA may ultimately determine viral persistence or clearance. Therefore we determined the methylation status of 5 CpG sites in the L2 genes from 222 unique HPV16-positive visits from women who were categorized as “clearers” or “persisters”. DNA samples were bisulfite converted and amplified with the EpiTect® Whole Bisulfiteome kit. PCR was performed for individual biotinylated amplicons containing CpG sites of interest. Pyrosequencing of samples to determine the extent of methylation was carried out by EpigenDx and analyzed with PyroMark® Software.

Discussion: There were interesting variations in methylation status at the individual CpG’s that were not statistically significant with any trend analysis attempted. Analysis by ethnicity in this subset presented differences in methylation status trends. While not statistically significant, the data was not analyzed under the context of global methylation which has been shown by others to be lower in African American women. Finally, we analyzed the SNP MTHFR rs1801131, a key regulator in folate metabolism. In the entire CWCS cohort, participants with the AA homozygous allele were found to be 0.4x less likely to be a persister than the CC or AC allele. Our subset showed a decreased percentage of African Americans with the AA allele, however the statistical correlation was not to persistence but ethnicity.

Discussion: Although there are tantalizing suggestions of trends, limited sample numbers prevent the achievement of statistical significance. It is not possible to rule in or out the potential predictive benefit of measuring HPV methylation long before the appearance of abnormal cytology.

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Poster presented at 30th International Papillomavirus Conference September 2015
NIH grants R21 CA169998 and P20 MD001770
ATTITUDES AND PRACTICE PATTERNS REGARDING TRIAL OF LABOR AFTER CESAREAN DELIVERY
Fran Bailey, MD¹, Bo Cai, PhD² and Courtney Brooks, MD³
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Department of Epidemiology and Biostatistics, University of South Carolina, Columbia, SC

Abstract

Background and significance: In the United States the rate of cesarean deliveries has increased drastically over the last 30 years. Repeat cesarean plays a large role in increasing the overall cesarean rate. Trial of labor after previous cesarean delivery (TOLAC) is a feasible option for many women who have had a prior cesarean. The rate of TOLAC in the United States appears to be decreasing. Hesitation to offer TOLAC centers around the associated potential complications of failed TOLAC including uterine rupture with associated maternal and neonatal morbidity. Given the high cesarean rate in the United States and the declining TOLAC rate, there is great interest in assessing ways to increase the TOLAC rate for appropriate candidates in order to decrease maternal morbidity and mortality associated with cesarean delivery.

Methods: We distributed an email to obstetricians throughout South Carolina inviting them to participate in a de-identified survey designed to assess their practice patterns and management of patients with a history of prior cesarean and to identify barriers to TOLAC.

Results: Of the 58 total survey responses obtained, 48 were eligible for statistical analysis. The majority of responders (58%) classified their hospital as urban. 27% practiced at an academic institution. The majority (33%) completed residency 21-30 years ago. Only 4% of responders reported never offering TOLAC. Concern over liability was the major limiting factor to offering TOLAC (45%), with prior adverse outcome a close second (38%). 7% reported anesthesia not being immediately available in their hospital as a barrier to offering TOLAC. 17% reported hospital policy limited their ability to offer TOLAC. The vast majority of survey participants (92%) indicated that TOLAC is a reasonable option for many women with one prior cesarean delivery. The majority (68%) indicated that ACOG outlines clear guidelines for offering TOLAC. Most obstetricians surveyed (71%) do not use a scoring system to assist in the prediction of successful vaginal birth after cesarean (VBAC). 67% reported they will induce labor in patients desiring TOLAC. 85% of providers reported they always or frequently counsel appropriate patients towards TOLAC; however, 63% of responders reported the majority of their patients did not accept TOLAC after counseling.

Discussion: Immediate availability of anesthesia personnel for women with a previous cesarean is considered a requirement for offering TOLAC, but does not appear to be a significant limiting factor among obstetricians surveyed. Only a small number of participants cited hospital policy as limiting their ability to offer TOLAC. The majority of providers who participated in this survey reported that TOLAC is a reasonable option for women with a history of one prior cesarean, but counseling by the provider appears to have a significant impact on the current TOLAC rate.

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Category: Clinical /Oral presentation
INTEGRATED GENOMIC ANALYSIS IDENTIFIES A NEW CATEGORY OF CERVICAL CANCER

Carolyn E. Banister¹, Lucia Pirisi², Kim E. Creek¹, Phillip J. Buckhaults¹
¹University of South Carolina College of Pharmacy, Columbia, SC
²University of South Carolina School of Medicine, Columbia, SC

Background and Significance: The continuous expression of HPV oncogenes is responsible for initiating and driving cervical cancer. Current treatments include radiation and Cisplatin-based chemotherapy. Targeted therapies can be directed to specific subset of tumors if they are known.

Methods: Molecular genetic data generated by The Cancer Genome Atlas (TCGA) was analyzed.

Results: We discovered and characterized a subset of HPV positive cervical cancers that do not express HPV transcripts. The tumors more commonly appear in women who are 10 years older at diagnosis (p-value = 0.023) and reveal decreased probability of survival (p-value 0.06). Gene expression profiles are different between the tumor types. As expected, HPV Expressing tumors show enrichment for E2F target genes, while the Non-Expressing tumors show enrichment for WNT/beta-catenin target genes. The majority of differentially expressed genes can be explained by DNA hyper methylation and silencing of expression in HPV Expressing tumors. Somatic mutation landscapes are significantly different. HPV Non-Expressing tumors are significantly enriched for non-synonymous somatic mutations (p-value <0.0000001) compared to HPV Expressing tumors.

Conclusions: Many of the somatic mutations found in non-expressing tumors mimic the functions of the E6 and E7 viral oncoproteins, such as TP53, CTNNB1, EGFR and KRAS somatic mutations. Unexpectedly, BRCA1 and BRCA2 somatic mutations are more frequent in the HPV Non-Expressing tumors. Therapeutic strategies based on PARP inhibition may be effective against this category of cervical cancers. Novel therapeutics that exploit other unique somatic differences between HPV expressing and non-expressing tumors may improve survival for cervical cancer patients.

Contact Information  Category: Basic Science

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RETROSPECTIVE REVIEW OF PROPHYLACTIC BILATERAL SALPINGECTOMY (BS) AT PALMETTO HEALTH RICHLAND: EVALUATION OF RATES AND PERIOPERATIVE COMPLICATIONS
Kristin Bell, DO, Chandler Finney MS4, Brandon Kats MS2, Allison Jackson, MD
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Abstract

Objective: Ovarian cancer is the most lethal gynecologic malignancy and is the fifth leading cause of cancer deaths among women. Current evidence suggests that high grade serous ovarian cancer originates in the fallopian tube. Therefore, it is thought that bilateral salpingectomy (BS) will decrease the risk of future ovarian cancer. Our goal for this study is to observe the trend in rates of BS at our academic institution over the last three years and evaluate for changes in operative time and complications in those patients undergoing BS.

Methods: Exempt Institutional Review Board review was obtained. A retrospective chart review was performed of patients who underwent hysterectomy with and without salpingectomy for benign conditions at Palmetto Health Richland from January 1, 2012 through December 31, 2014.. Charts were identified by Palmetto Health IT Department using CPT codes. Exclusion criteria included salpingectomy for management of malignant pathology and history of coagulopathy or bleeding disorder. The descriptive statistics were summarized by calculating means and standard deviations for continuous variables and frequencies for categorical variables. To test for a difference between BS and no BS, the t-test is used for continuous variables and the Chi-square test for categorical variables.

Results: In total 921 samples were collected across three years. The majority of these procedures were done by attending level surgeons for uterine fibroids (42.8%) and abnormal uterine bleeding (23.48%). Body mass index, race and insurance status were the same across both groups. A significant increase in the rate of BS was seen over the observed time period (27.8% 2012, 41.9% 2013, 46.8% 2014, P<0.0001) Length of procedure, estimated blood loss, intraoperative/postoperative complications and unplanned readmissions were the same in the BS and no BS groups. We found an association between BS and patient age, uterine weight, and mode of hysterectomy.

Discussion: Our findings demonstrate an increase in the performance of BS in benign procedures at our institution. Additionally, there do not appear to be increased operative risks associated with performing BS at the time of hysterectomy. These results are consistent with the results of other facilities and should encourage routine planning for BS at the time of benign hysterectomy.

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Category: Clinical /Oral presentation
SEX DIFFERENCES IN REGULATION OF SYMPATHETIC TONE AND NEUROPSYCHOLOGICAL TASK PERFORMANCE REQUIRING SELECTIVE ACTIVATION OF THE LEFT FRONTAL LOBE
Cristina Blanco, Michael Doster, Alana Rosa, Angela Neal and Alissa K. Holland

Background and Significance: Sex differences in brain morphology have been well documented (Wittelson & Goldsmith, 1991). Specifically, studies have found that women have a larger corpus callosum (CC) relative to men (Burke and Yeo, 1994) especially in the genu, defined as the anterior CC. One of the assumptions of the current research is that increased CC volume allows for increased interhemispheric transfer of information during task completion. This is especially true for tasks involving selective activation of the left and right frontal lobes. As follows, it is predicted that women will evidence increased performance on a neuropsychological task involving relative recruitment of left frontal resources (verbal fluency) and right frontal resources (design fluency) relative to men.

Methods: Right-handed undergraduate men (n=34) and women (n=45) with no history of head trauma completed the following protocol. Each participant was fitted with a blood pressure cuff before completing the Controlled Oral Word Association Task (COWAT) and the Ruff Figural Fluency Task (RFFT). Heart Rate (HR) and Systolic Blood Pressure (SBP) readings were taken before and after completion of these tasks. Order of task completion was counterbalanced between subjects.

Results: A main effect for Sex for perseverative errors made on the COWAT was found ($F(1, 77) = 13.55, p = .0004$), indicating that men made more perseverative errors relative to women. A Sex x Trial interaction was found ($F(1, 77) = 5.01, p = .03$), indicating that men made more perseverative errors on the last 3 trials of the COWAT, whereas women made less errors on the last 3 trials. This interaction was not present when analyzing results for the RFFT ($F(1, 77) = 2.39, p = .13$). Finally, a main effect for Sex for SBP was found ($F(1, 78)$, indicating that men evidenced higher SBP across all experimental conditions relative to women.

Discussion: The hypothesis that women would evidence increased performance on the verbal and design fluency tasks was partially supported. While women did make less perseverative errors on the verbal task relative to men, there was no sex difference in perseverative errors on the design task. Moreover, there were no sex differences in the number of unique designs produced on either task. There was, however, a sex difference in regulation of sympathetic tone, as indicated through increased SBP for men across all conditions. This indicates a reduction in right frontal activation. Taken together, men appear to evidence reduced frontal lobe activation, which may be attributable to a smaller corpus callosum.

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TRIPLE NEGATIVE BREAST CANCER IN THE PALMETTO HEALTH BREAST CANCER DATA BASE: a PRIMARY COMPARISON OF RACE WITH SUBSET COMPARISONS OF TUMOR TYPE, NODE STATUS, AJCC STAGE, AGE, AND MORTALITY OUTCOMES. FOLLOWED BY AN OVERALL COMPARISON TO THE SEERS NATIONAL DATA BANK.
Tabitha Burton M.D., Alexander Walters, Benjamin Childes, and Christopher Chu
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Abstract
Introduction: Previous studies have demonstrated the link between triple negative breast cancer (TNBC) and African American race. This is known to be an aggressive subtype of breast cancer with limited treatment options and high morbidity and mortality rate. New research is aimed at the genetics behind TNBC to potentially offer improved treatment options for these patients. South Carolina demographically has a high percentage of black females. Thus we wanted to evaluate race and triple negative receptor status in our population to see if we follow the national trend and if our patients would benefit from further research in this field

Patients and Methods: The study consisted of female patients (n=3157) from the Palmetto health breast cancer data bank diagnosed with breast cancer from the years 2000 to 2010. There were a total number of white females (n=2043) and black females (n=1061). We divided the data bank by race and then selected out to compare all patients in both races diagnosed with triple negative breast cancer (TNBC) with white females TNBC (n=172) and black females (n=216). After comparing TNBC results by race, we then compared age groups, node status, AJCC stages, histology type, and mortality rates within each race, between the two races, and finally to the national SEERS data bank.

Results: TNBC was more prevalent in black females compared to white females (20.3% vs 8.4%). The most common histologic type for both races for TNBC was invasive ductal carcinoma grade 3 with poor differentiation. Black females had higher percentage of node negative disease and a higher number of women diagnosed less than age 50 compared to whites. The majority AJCC stage at diagnosis are stage I and stage 2A for both races. However, black females more likely to be diagnosed at higher AJCC stage (3C and 4) and have higher mortality compared to whites. Odds ratios and confidence intervals were calculated as well as two sampled t test for age and race.

Discussion: This registry-based data bank confirms that TNBC varies by race with a higher prevalence in black females. The South Carolina study correlates with the SEERS national data bank with race and age. However, when comparing AJCC stage at diagnosis of black females in South Carolina verses the black females in the SEERs databank, there is a statistically significant difference.

Conclusion: Although the South Carolina data bank follows the trend of the SEERs databank and additional studies comparing race and receptor status, there is an interesting difference in AJCC staging. The databank is flawed with weak follow up of patients after five years of diagnosis. It would be of benefit to fund research to include: 10 year follow up of these patients, types of treatments received, number of recurrences, and potentially genetics of each diagnosed with TNBC.

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Abstract

**Background/Significance:** Assisted reproduction can offer infertile couples the opportunity to have a successful pregnancy, yet the chances of having a live birth in women <35 years of age approaches only about 50% per cycle. During oocyte maturation, the interaction between the cumulus granulosa cells and the oocyte influences oocyte health. For in vitro fertilization (IVF), cumulus-oocyte-complexes (COCs) are isolated from ovaries. The cumulus cells are removed from the COCs and typically discarded prior to in vitro fertilization of the oocyte. We hypothesize that cumulus cell mass isolated from individual COCs will express a gene signature which can be used to identify viable oocytes with high potential to make embryos yielding successful pregnancies. The goal is to develop a panel of cumulus cell mRNA biomarkers that IVF clinics could use to predict the best blastocyst for implantation into the patient.

**Methods:** A literature review of microarray data from human cumulus cells identified mRNA biomarkers that are associated with oocyte maturation and embryo quality. Primer sets were validated for use in quantitative real-time PCR (qPCR). For each oocyte, the cumulus mass was separated, snap frozen and stored at -80°C separately until RNA was isolated. Developed embryos underwent preimplantation genetic screening for chromosomal abnormalities which allowed determination of chromosomally normal and abnormal embryos. A single normal embryo was transferred into each patient. QPCR was performed with individual cumulus cell mass cDNA for the following mRNAs: STARD1, HSD3B, COX2, PAPPA, and TBP (control gene). Data for n=4 patients was analyzed by ANOVA and Tukey’s HSD test.

**Results:** Oocytes were categorized into six groups based on their resulting embryo status: 1) normal embryos which are still frozen, 2) embryos of women currently pregnant, 3) aneuploid embryos, 4) arrested embryos, 5) mature oocytes with failed fertilization, and 6) immature oocytes. In the cumulus masses analyzed, STARD1 mRNA levels were not different between groups. HSD3B was significantly different between the normal embryo cumulus masses that resulted in pregnancies and that of the aneuploid embryos. COX2 mRNA levels were significantly different in the normal embryo group (frozen) in comparison to the normal embryos that resulted in pregnancy; in addition, the normal embryo-pregnant group differed significantly from the aneuploid group. PAPPA mRNA levels did not differ significantly between groups but there was a trend (P=0.06) between the pregnant and aneuploid groups.

**Discussion:** Our preliminary data showed that HSD3B and COX2 mRNA levels differ between embryos which form a pregnancy and aneuploid embryos. Findings with HSD3B are consistent with a report in the literature. PAPPA showed a trend which needs to be verified in a larger sample size. Ongoing studies with more patients and the evaluation of additional mRNA biomarkers are in progress. We hope with a larger sample size and additional biomarkers that we can develop a model of gene expression to predict oocyte quality and its pregnancy potential.

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Category: Basic Science
RURAL-URBAN DIFFERENCES IN MEDICARE SERVICE USE AMONG WOMEN IN THE LAST SIX MONTHS OF LIFE

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Abstract

**Background and Significance:** Previous research has found wide variations among Medicare beneficiaries in service utilization during the last six to twelve months of life. The variations can be associated with resource availability, region, and hospital type, for example.\textsuperscript{1} Other variations in service utilization are associated with demographics such as gender, with women using more social support services such as skilled nursing, home health, and hospice compared to men.\textsuperscript{2} Gender differences among Medicare service use has been limited to special populations, with little attention to rurality.\textsuperscript{3, 4} Research concerning end of life care among rural residents, particularly female residents, is sparse but indicative of differences.\textsuperscript{5, 6} We examined whether service utilization (inpatient stays, physician visits, long term care, skilled nursing, home health, or hospice) among women in the last six months of life differed by rurality.

**Methods:** Data were drawn from the 2013 Medicare Research Identifiable Files. The study population was limited to beneficiaries who were eligible for Medicare for the entire year and died after June 30, 2013. Exclusions were made for beneficiaries with missing data for the covariates. The decedents (n=29, 418) represented 1.7\% of female beneficiaries in the sample. Rural and urban counties were designated based on Urban Influence Codes obtained from 2013-2014 Area. Statistical analysis and merging of data was conducted in SAS 9.4. Demographic differences between the groups were tested using Wald Chi Square tests. Per-beneficiary count of each service category during the last six months of life, with comparisons tested using Wald Chi Square tests.

**Results:** A larger proportion of the deceased rural female residents utilized health care services, such as inpatient stays (62.1\%), outpatient visits (84.8\%), skilled nursing (30.2\%), and physician visits (73.4\%). Rural residents were less likely to have utilized hospice in their last six months of life than urban residents (47.9\% versus 54.7\%). Subset by race/ethnicity, urban residents were significantly more likely to utilize hospice services than their rural counterpart.

**Discussion:** Our findings illustrate disparities in service utilization patterns between rural and urban women. Rural women were more likely to utilize healthcare services than urban women, with the exception of hospice. Confirming previous research, we find that rural residents are less likely to use hospice care than their urban counterparts. This may be a result of accessibility, personal preference, and various other factors. This highlights the need for further research examining the differences between urban and rural women during their last six months of life.

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Category: Social Science
METHYLMERCURY PARTITIONING IN MALI RICE
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Abstract
Fish is the primary exposure pathway for methylmercury, a potent neurotoxin. Rice ingestion is also an important source of dietary methylmercury in regions where rice is a staple food and environmental mercury contamination is serious. Most research concerning rice and methylmercury was completed in China; rice is also a staple food in West Africa, including Mali. The primary objective was to investigate partitioning of mercury species (inorganic mercury and methylmercury) in rice plants, in rice varieties commonly consumed in Mali.

Methods: In 2014, three rice varieties were cultivated in a temperature-controlled greenhouse in two chambers. In one chamber, rice plants were grown in low-mercury paddy soil (approximately 20 ng/g), and in a separate chamber, the same rice varieties were cultivated in paddy soil spiked with inorganic mercury (50,000 ng/g) to simulate conditions in a mercury-contaminated site. Rice varieties included two Oryza sativa and one variety of Oryza glaberrima. Pots were flooded throughout the rice cultivation season. At the harvest, pore water, paddy soil, rice roots, flag leaves, and rice grain samples were collected from each pot. Total mercury and methylmercury concentrations were analyzed in all samples, including polished and unpolished rice grain.

Data analysis is ongoing. Once completed, results will indicate whether there are differences in the uptake and partitioning of methylmercury in these Malian rice varieties. These data are important for identifying rice varieties that mitigate dietary methylmercury intake under background and contaminated conditions.

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THE CIRCLE GAME: THE EFFECTS OF CONTINUAL CHANGE & GRIEF AMONG WORKERS IN LONG TERM CARE
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Abstract

Background and Significance: Many residents of Long Term Care (LTC) facilities experience fractured, fragmented or fragile relationships with family members. The relationships which develop between residents and workers often take on familial characteristics. Such relationships can be meaningful for, both, those who live and those who work in LTC settings. Although many studies have illustrated relationships between family caregivers and the people for whom they care, relatively little research has explored the relationship between professional caregivers in LTC and LTC residents. This descriptive study examines the role of change and grief upon these relationships.

Methods: This descriptive study was conducted to begin a conversation regarding the effects of change and grief among workers in Long Term Care. A survey was created, based upon the Georgia Quality Initiatives model. Surveys were developed in both English and Spanish. This study was conducted through a mixed-methods survey, distributed by convenience, to 100 employees of a LTC facility (N=100), across departments and shifts. 81 surveys were returned, 2 surveys were refused and 17 surveys were not returned. In addition, interviews were conducted, following the survey. Interviewees were randomly selected from participants.

Results: Across all departments and shifts, the vast majority of staff describe a positive level of job satisfaction, describing their work environment “like family” and their position as “a calling.” The majority of LTC staff surveyed describe relationships with residents as “familial.” The majority of LTC staff report mourning the loss or death of residents as much as, or greater than, the loss of a family member and report that grief is, often, unacknowledged and unresolved. The majority of LTC staff report that this unresolved grief impacts job satisfaction. The impact of grief was reported to be least among administrative staff and greatest among direct care workers.

Discussion: The small sample size affected the findings of significance; however, this study found a strong relationship between those who work, and those who live in, the LTC setting. Relationships are meaningful to staff and are reported to be related to, both, job and self-satisfaction. As the general population continues to age, relationships between staff and resident will continue to impact the quality of life for many seniors and professional caregivers. This descriptive study provides information about the familial nature of these relationships and provides an argument for further examination.

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PREVIOUSLY PRESENTED: NASW-SC ANNUAL SYMPOSIUM 2014, WORKSHOP
A CCL8 GRADIENT DRIVES BREAST CANCER METASTASIS
Elena Farmaki\textsuperscript{1}, Ioulia Chatzistamou\textsuperscript{2}, Vimala Kaza\textsuperscript{1}, and Hippokratis Kiaris\textsuperscript{1}.

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Abstract

\textbf{Background and Significance:} The establishment of chemoattractive gradients between the neoplastic epithelium, the stroma and the peripheral tissues represents an attractive, yet elusive, mechanism that may contribute to cancer cell dissemination. Here we provide evidence for the maintenance of a gradient of increasing CCL8 concentration between the epithelium, the stroma and the periphery that is instrumental for breast cancer cells’ dissemination promoting the directional movement of cancer cells from the site of primary tumor towards the periphery.

\textbf{Methods:} \textit{In vitro} experiments were performed using breast cancer cells and fibroblasts for co-culture and transwell-based migration assays. For the \textit{in vivo} studies we used wt and Ccl8KO mice bearing EO771 tumors or nude mice bearing MDA-MB-231 tumors.

\textbf{Results:} CCL8 expression in fibroblasts was induced by signals elicited by the neoplastic epithelium, inducing the migration of breast cancer cells and establishing a self-sustained gradient of CCL8 around the stroma. Analysis of mice tumors indicated the stromal origin of CCL8 that is also consistent with the strong correlation observed between circulating levels of CCL8 and tumor size. In addition, CCL8 expression was induced in the peripheral organs of mice such as lungs and brain in response to tumor-derived signals that may also contribute to organ-specific metastasis of breast cancer. Genetic and antibody-based manipulation of CCL8 activity in mice influenced the histology of the tumors and promoted all major steps of the metastatic process, including invasion to adjacent stroma, intravasation and ultimately extravasation and seeding.

\textbf{Discussion:} Analysis of publicly available data suggested that CCL8 is overexpressed in breast tumors as compared to normal breast tissue while high CCL8 expression in clinical breast cancers is associated with poor prognosis. These findings exemplify how self-sustained CCL8-like gradients of chemoattractive factors, between the epithelium, the stroma and the periphery can be induced by breast cancer cells to drive the metastatic process and suggest that interference with their operation may provide means for breast cancer management.

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\textbf{Category: Basic Science}
CASE REPORT: ETONOGESTREL SUBDERMAL IMPLANT FAILURE IN TWO PATIENTS

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Abstract

Background
Etonogestrel subdermal implants are considered 99.9% effective at preventing pregnancy for three years.

Case
26-year-old G3P2002 with Implanon in place for 29 months presented with positive urine pregnancy test following cessation of menses. Viable intrauterine pregnancy was confirmed via transvaginal ultrasound with EGA of 6 weeks/1 day. Medical history was insignificant with no reported concomitant medications. Implanon was immediately removed. Viable male infant was born at 39 weeks/6 days with Apgars of 8 and 9.

26-year-old G2P1001 with a medical history significant for epilepsy on Carbamazepine experienced Nexplanon failure within 12 months of placement. β-hCG was 1528. Transvaginal ultrasound revealed an abnormal gestational sac; viable intrauterine pregnancy was not confirmed. Nexplanon was removed. Complete spontaneous abortion occurred within one week.

Conclusions
Despite extremely high efficacy rates, cases of etonogestrel subdermal implant failure do occur and should be reported.

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Accepted for oral presentation at the 78th Annual Meeting of the South Atlantic Association of Obstetricians and Gynecologists to be held January 30 – February 2, 2016 in Charleston, SC.
CHOOSE WELL: A MOVEMENT TO INCREASE CONTRACEPTIVE ACCESS IN SOUTH CAROLINA
Tiffany E. Fishburne1,2, Deborah Billings1,3, and Lucy Annang Ingram1,4

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Abstract:
Background and Significance: In South Carolina, over 50% of all pregnancies are unintended and are related to negative physical and mental health outcomes, decreased graduation rates, and a more complicated trajectory toward economic security for young women, men and their families. South Carolina’s history relative to reproductive health is fraught with coercive and unethical policies and practices. Movements have arisen to ensure that the rights of all people, especially low income communities most often targeted by such policies, are guaranteed in relation to reproductive health, including contraceptive access. Choose Well fits into more recent emerging movements that focus on creating the conditions in which women and men can choose the contraceptive methods that work best for them, free from coercion and stigma. Choose Well is an outcomes-based initiative in South Carolina, which aims to create the conditions through which women and men can prevent unintended pregnancy. For the work presented in this poster, we investigated perceptions and beliefs about contraception among young adults in Columbia, South Carolina, ages 18-29. This is the age range for the highest rates of unintended pregnancy, both nationally and state-wide.

Methods: The study used a mixed methods study design with a questionnaire, one-on-one interviews, and focus groups. Participants were randomized to focus groups by gender. Convenience and snowball sampling techniques were used. Recruitment flyers were posted on university campuses, university and professional listservs, and disseminated through word of mouth. A total of 5 focus groups and 3 interviews were held in the Columbia, South Carolina area with 18-29 year old men and women. We explored topics ranging from perceptions of school based sexual education to the safety of long acting reversible contraceptive methods. Each participant received a $15 cash token/gift card and a publication on contraceptive methods. Qualitative data were analyzed using thematic analysis.

Results: Sexuality education received in schools was most often described as “inaccurate”, “ineffective”, “A scare tactic”, and “not enough”. Similarly, 92% of vocal respondents said that they do not receive enough information about birth control in doctors’ offices and relate this to contraception not being discussed much, if at all. Over half of respondents (53%) to the question “Would you even consider using a LARC in the future” said they would not. When asked what would change their mind, the majority of responses related to lack of information and unfamiliarity with how the devices worked.

Discussion: Study findings show that, although great advancement has been made in the realm of reproductive health, young adults are still apprehensive and uninformed about contraceptive methods. The lack of education about reproductive health and a stigmatized history are important factors. Implications of these findings are particularly useful for health care providers, as they are a qualified source of health information that unfortunately is not giving young adult patients the breadth of contraceptive information they desire.

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Abstract

Background: Persistent human papillomavirus (HPV) infection is the primary risk factor for cervical cancer development. In order to fully understand the determinants of progression from transient HPV infection to either clearance or persistence, it is necessary to understand the immune response to HPV infection. T cells are key players in the body’s response to HPV. In response to HPV infection, T cells are responsible for both effective elimination of infected cells and direction of the immune response by secretion of cytokines. T cells that secrete IL-17, named Th17 cells, have been recently identified in cervical cancer. Th17 cells produce pro-inflammatory cytokines and they have been found to play an important role in inflammation and autoimmune disease but their role in cervical cancer remains unknown. The aim of our study is to optimize immunohistochemistry procedures in order to determine the relative presence of Th17 cells and regulatory T cells in formalin-fixed, paraffin embedded cervical cancer tissue and to apply the staining technique to cervical tissue arrays.

Methods: Immunohistochemical staining was used on formalin-fixed, paraffin embedded cervical tissue samples to stain lymphocytes in order to visualize them using a light microscope. Lymphocytes were identified with cell-specific markers and the tissue was counterstained with Methyl Green for contrast.

Results: Several staining techniques were attempted including alteration of antigen retrieval techniques and variation of both primary and secondary antibody and concentration. Although no specific staining has been observed at this time, the procedure is still being optimized.

Conclusion: Optimization of immunohistochemical staining procedures is ongoing until the lymphocytes can be visualized using a light microscope. These techniques, once optimized, will be applied to tissue arrays containing normal cervical tissue and varying degrees of cervical dysplasia and cancer to determine the relative presence of the lymphocytes in CIN and cervical cancer.

Contact Information: Category: Basic Science
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USING SYNTHETIC LECTINS TO INVESTIGATE METASTATIC POTENTIAL IN COLON CANCER
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Abstract
Colon cancer is the third most common type of cancer in both men and women worldwide with at least 600,000 colon cancer-related deaths annually. Current colon cancer diagnostics, e.g. colonoscopy, are invasive and often inaccurate because they rely on visual inspection, which can be subjective. Monitoring cancer biomarkers using a fluid-based diagnostic is an optimal strategy though existing methods suffer greatly from low effectiveness associated with high false negative and false positive rates. The work presented describes progress towards developing a blood-based colon cancer diagnostic.

Our approach focuses on aberrant glycosylation, which impacts integral cell membrane and secreted glycoproteins from the onset and throughout progression of the disease. Here, boronic acid functionalized peptides, termed synthetic lectins (SLs), are used in a cross-reactive sensor array to monitor changes in glycosylation patterns displayed on cancer cells as well as secreted proteins.

Methods: Towards a fluid based diagnostic, secreted proteins and glycoproteins were isolated from cell culture media as an in vitro model of tumor secreted proteins. Four human colon cell lines were grown in culture: CCD-841 CON (Healthy), HCT 116 and HT29 (Cancerous, Non-Metastatic), and Lovo (Cancerous Metastatic). Secreted and membrane proteins were fluorescently labeled and incubated with the SL array and imaged using fluorescent microscopy. These images were analyzed using software within MATLAB.

Results: Using linear discriminant analysis (LDA) to interpret the fingerprint pattern from the sensor array, SLs can effectively discriminate four human colon cell lines based on metastatic potential. When using cell membrane extracts, SLs can discriminate between healthy, cancerous low-metastatic, and cancerous high-metastatic cells with 100% classification accuracy. Using the same approach to evaluate the proteins and glycoproteins secreted into cell culture media, 96% classification accuracy is achieved.

Discussion: A blood-based diagnostic would be an ideal method rather than a colonoscopy and biopsy in the detection of colon cancer. The high classification accuracy in this proof of concept experiments suggests that the synthetic lectin array could be a useful tool in the diagnosis of cancer. Further studies would include clinical blood samples from patients.

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SBIRT: EVIDENCE-BASED STRATEGIES TO EMPOWER HEALTH PROFESSIONALS ADDRESSING SUBSTANCE USE

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Background: Substance use poses high morbidity, mortality and economic burden and adversely effects treatment compliance in both medical and psychiatric care. Approximately 30% of adults use alcohol at unhealthy levels and 6-10% misuse legal and illegal drugs. While studies have shown that people are open to talking about substance use, only 1 in 6 people report engaging with a healthcare provider about substance use. Training in substance use assessment and management among healthcare professional is insufficient compared with other preventable illnesses despite initiatives to support such training. Additionally, training for healthcare providers who are already in practice is also underemphasized and not readily available. The SAMHSA (Substance Abuse and Mental Health Services Administration) SBIRT protocol (Screening, Brief Intervention, and Referral to Treatment) provides an evidence-based method for quick and early identification of risky substance use, promotion of low risk use levels and effective early intervention and treatment for those whose substance use poses health threats. Because it can be taught in a relatively short didactic session and delivered within the time constraints of any busy practice setting, the SBIRT approach is an ideal skill for every healthcare practitioner.

Objectives: Viewers will understand the components, goals and rationale of SBIRT, the rationale and use of Screening including substance use limits and associated health risks, understand the application of MI (motivational interviewing) skills to conduct a Brief Negotiated Interview and recognize the criteria for Referral to Treatment, types of treatment and common treatment referral mistakes.

Method: This poster will illustrate the SBIRT concepts and tools in a step-by-step format outlining the importance and process of SBIRT and directs viewers to sources for more in-depth SBIRT training. The poster is aimed at all health professionals and viewers will learn the goals and components of SBIRT, understand the rationale and use of Screening tools, gain an understanding of when and how to conduct a Brief Intervention and understand the criteria for a Referral to Treatment.

Summary: It is imperative that health professionals possess skills that address common problems like substance use and know how to employ these skills in a time efficient manner. Gaining SBIRT skills benefits those we care for by providing clinically validated identification and early intervention strategies which direct patients to services. Poster viewers will gain the opportunity to learn about a practical and evidence-based protocol to assess substance use and know how to obtain further training.

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A similar poster was presented at the 9th World Congress on Mental Health Sept. 10, 2015.
FATALISM REVISITED: FUTHER PSYCHOMETRIC TESTING ACROSS TWO SAMPLES
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Abstract

Background and Significance: Cancer fatalism, the belief that death is inevitable after a cancer diagnoses, has been extensively examined as an obstacle to early detection, especially in breast cancer. Some evidence suggests that fatalism remains after diagnosis and may impact treatment outcomes. Researchers have argued that current fatalism scales are inappropriate for samples of women who have been diagnosed with cancer. Our purpose is to examine the psychometrics of one of these fatalism scales, the modified Powe Fatalism Inventory (mPFI), in two samples of African American (AA) women diagnosed with breast cancer (BrCa) and provide recommendations as to its utility.

Methods: Our combined sample consisted of 313 Southern AA women with BrCa drawn from a sample of 184 women in an intervention study, Study One, and 129 women in a correlational study, Study Two. We used the modified mPFI, an 11 item scale which included four predetermination items, three inevitability of death items, three pessimism items, and one item related to God’s will. We applied classical test theory and item response theory based approaches to examine responses from each sample and the combined sample.

Results: For the combined sample, the items pertaining to predetermination and God’s will satisfied the conditions of Mokken scaling to be classified as a strong scale. This subscale's estimated reliability (coefficient alpha) was 0.8529. A conditional covariance based cluster analysis also verified that the predetermination and God’s will items clustered separately from the other items. The Mantel-Haenszel test for differential item functioning showed that one predetermination item worked differently for the two groups after controlling for how they did on items in the categories of predetermination and God’s will.

Discussion and Conclusion: Our analysis identified that items most of the predetermination items and one item measuring God’s will showed appropriate psychometric properties for measuring fatalism scale across two samples of African American women with breast cancer. We are intrigued that even though our two samples shared many similarities, their response to certain items was quite different; suggesting that factors other than race, gender, and age would be important to consider in interpreting results from the mPFI. Accurate measurement of fatalism is important as it may aid in understanding treatment adherence and ultimately survival outcomes.

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Category: Social Science

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Background and Significance: In 2012, South Carolina Medicaid enacted a policy to cover immediate postpartum insertion of long-acting reversible contraceptives (LARCs) in hospital settings. This policy was a coordinated effort put forth by the South Carolina Birth Outcomes Initiative (SCBOI) recognizing the high costs of unintended pregnancies and the underutilized opportunity for contraceptive services in the immediate postpartum period. The SCBOI prioritized expanding access to LARCs before women are discharged from the hospital after birth. LARCs – intrauterine devices (IUDs) and hormonal implants – are safe, highly effective, and recommended first-line methods of pregnancy prevention for most women (including sexually active adolescents). The South Carolina Medicaid policy allows hospitals to receive full reimbursement for the LARC device and the physician can bill for the insertion procedure while women are in the hospital. Since hospitals and physicians can recoup the costs for the insertion procedure and the device, this policy has removed a substantial barrier to providing immediate postpartum contraceptive services. The LARC postpartum toolkit is intended to assist other hospitals throughout South Carolina to successfully implement the policy, which involves changes in prenatal care counseling, educational outreach on billing and pharmacy procedures, and patient care during the hospital stay.

Methods: Interviews with physicians, nurses, and billing staff (n=8) from three successfully implementing labor and delivery hospitals in South Carolina, complemented by conversations with Medicaid staff and a literature review. Questions pertained to policy implementation, device procurement and storage, counseling procedures, billing processes, and any implementation challenges and steps required for resolution. The toolkit was reviewed by SCDHHS key staff and 3 other key stakeholders.

Results: Hospitals reported that the planning and implementation process took about six months and required action in four key areas: building administrative support and infrastructure, establishing protocols for physicians and nurses, training clinical staff, and continuous quality improvement. All participating hospitals follow similar procedures for patient counseling and consent and performing the insertions. Providers stated that contraceptive counseling begins during prenatal care and that contraceptive plans (if chosen) are transferred to the hospital. Collaborative efforts between pharmacy and labor and delivery departments identified ways to streamline procurement and stocking of devices tailored to each site. Billing recommendations included working with the assigned Medicaid Program Coordinator/Manager, and assessing if individual billing systems allow for adaptions to include line items outside the DRG.

Discussion: The LARC toolkit provides vital implementation recommendations for South Carolina hospitals. The launch of the toolkit will take place at the Birth Outcomes Symposium in November 2015. The toolkit will be an online resource, readily available to providers and easily adaptable to align in real-time with any policy changes or recommendations from Medicaid and hospitals.

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Category: Clinical Science
ATTITUDES AND PERCEPTIONS REGARDING MARIJUANA AND MEDICAL MARIJUANA AMONG FOURTH YEAR MEDICAL STUDENTS IN THE UNITED STATES
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Background: States have legalized the use of marijuana and medical marijuana in increasing numbers over the past decade. There is a growing interest in the knowledge regarding, attitudes towards and perception of the use of medical marijuana among physicians as it is prescribed, certified or encountered by allopathic or osteopathic physicians licensed in these states. In a survey (n=1063) conducted by the New England Journal of Medicine, 76% of physicians from North America (US, Mexico, and Canada) favored the use of marijuana when presented with a case scenario about a 68 year-old female with metastatic breast cancer (Adler JN & Colbert JA, 2013). The survey responses indicated significant polarization in opinion regarding this matter in that some advocated its use for the alleviation of suffering while others voiced concern about lack of evidence for its efficacy. A similar survey conducted elicited mental health professionals’ (psychiatrists, psychologists, nurse practitioners, and physician assistants) opinions on the use of marijuana as a medication. There were 2200 respondents, 1138 of whom were psychiatrists, and of those, 930 were practicing in the United States. The respondents were largely from states where medical marijuana is not legal, were unclear about how to get information on prescribing medical marijuana (45%), and had not been asked by patients to prescribe medical marijuana (69%) (Kweskin S, 2013). As future physicians, medical students’ perceptions and attitudes towards marijuana and medical marijuana may influence future trends in marijuana use.

Methods: This study examined medical students’ attitudes and perceived risks and benefits of the use of marijuana and medical marijuana. Two hundred and thirteen United States fourth year medical students nationwide completed the 17 item questionnaire delivered via Survey Monkey®. Medical schools were initially contacted with a letter that contained information on the survey, including its purpose, and a link to the survey. The representative (Student Affairs Dean or Dean for Education) at each medical school chose whether or not to distribute the link to the fourth year students. Approximately 75 medical schools were contacted. Items of the survey were designed to obtain the following information: demographics of survey participants; attitudes regarding the use of marijuana and medical marijuana; perception of patients seeking or using medical marijuana; likelihood to prescribe medical marijuana; perceived risk of use of marijuana; and self-rated perception of knowledge regarding this topic. This survey was approved by the USC SOM and Palmetto Health Institutional Review Boards.

Results: Two hundred and thirteen United States fourth year medical students completed the survey from July 1, 2014 to February 5, 2015. One hundred females and 113 males completed the survey. The majority (78%) of survey participants were Caucasian with 10% Asian, 3% African American, and 7% other. The majority of respondents were currently attending medical school (45%) and had attended the majority of their primary education (K-12th grade) in the Midwest (36%). The odds of a male favoring legalization of marijuana were 3.70 times more than his female peers. However, in regards to legalization of medical marijuana, the odds of a male favoring it were only 2.03 times as great as the odds for female peers. Men and women were similarly likely to respond they would prescribe medical marijuana. There did not appear to be a difference in responses between medical students from the West (where more states have legalized) compared to their peers nationwide in regards to legalization of marijuana (OR 1.12); however, those students from the West were more likely to favor legalization of medical marijuana compared to their peers nationwide (OR 3.55). Though the difference is not statistically significant likely because there were fewer participants from the West (n=20), we did find that 95.0% of students from the West favored legalization of medical marijuana compared to their peers from other regions of the country (84.2%).

Conclusions: Current medical students’ attitudes and perceptions about the use of cannabis, both for medicinal and recreational purposes, may influence and shape future trends. Though the number of respondents was small, this study provides more information about how future physicians perceive marijuana and how they may proceed in their recommendations to patients. More information is needed to better understand participants’ responses.

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DESIGN AND ACTIVITY RELATIONSHIPS OF SYNTHETIC LECTINS TOWARDS AN IMPROVED DIAGNOSIS AGAINST COLORECTAL CANCER

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Abstract

Background & Significance: Colorectal cancer ranks as the third in mortality rate worldwide and it affects men and women equally. Current biomarker techniques like CEA, CA 19-9 blood tests are associated with high false positive rates and are more useful as prognostic markers, thus making it essential to look for better diagnostic techniques. Aberrant glycosylation is seen at the onset of a wide range of diseases, including cancer. There are several ‘cancer associated glycans’ (CAGs), such as sialic acid, fucose and mannose, which are differentially expressed in colorectal cancer. These differential glycan expression patterns can be studied by their interactions with lectins, which are glycan binding proteins. We synthesize lectins (synthetic lectins or SLs) that recognize cancer specific CAGs including the ones expressed in colorectal cancer. SLs are small peptide chains functionalized with boronic acids. These SLs were first screened against purified glycoproteins to establish proof-of-concept. These glycoproteins express similar glycans which are also present in CAGs. Certain SLs after incubation with fluorescent glycoproteins showed higher affinity and were identified as “hits”. Using these hits against human colon cell membrane extracts, our current SL array has been shown to discriminate between healthy, non-metastatic and metastatic human colon cell lines with 89% classification accuracy.

Methods: The SLs were made by Fmoc peptide synthesis. The glycoproteins were fluorescently labeled (FITC) and incubated with the SL beads. The beads were imaged with fluorescent microscopy and the images taken were analysed using MATLAB. The membrane proteins used from human colon cell lines were first extracted, labeled with FITC and then incubated with the SLs. After incubation, the beads were imaged as described above.

Results: Further SL design modifications have been carried out and correlations between structural modifications and activity have been established. These modifications were studied using labeled glycoproteins. Based on these preliminary examinations, several new SLs against human colon cell lines have been identified, synthesized and tested. These new SLs were added to the existing SL array to make an extended array. The extended array can discriminate between healthy, non-metastatic and metastatic colorectal cell lines with enhanced classification accuracy of 100%.

Discussion: The new “designed” SLs when added to extended lectin array showed a better discriminating capability with diseased and healthy human colon cell lines. Thus a directed approach towards designing SLs, with keeping the properties of CAG’s in mind, may be a better way of investigating colorectal cancer. However, the mechanism of binding of SLs with the CAG’s must be examined further.

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Category: Basic Science

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A CROSS-SECTIONAL STUDY OF THE IMPACT TO COMMUNITIES WHEN BREAST CANCER EDUCATION IS INTRODUCED TO THE MEDICALLY UNDERSERVED: THE ICBraCaEd STUDY
Amy M. Hynes and Akayleeya Tate, Presbyterian College School of Pharmacy, Clinton, SC

Background and Significance: Breast cancer death rates have been declining for the past several decades in the United States. Unfortunately, death rates are still disproportionately high among the medically underserved. This study demonstrates that by providing brief, educational seminars to the medically underserved members of our local communities, we improve patients’ knowledge about breast cancer, the associated lifestyle and genetic risks, the signs and symptoms of breast cancer, and the many options available that allow patients to personalize their treatment plans. Through this expanded knowledge, we promote healthier lifestyle choices, earlier and more regular screenings, and genetic testing when applicable among patients. We are empowering patients to take an active role in their own healthcare.

Methods: The Impact to Communities Study [ICBrCaEd] is a cross-sectional, pre- and post-test study, and was approved by the IRB at Presbyterian College School of Pharmacy. By designing a PowerPoint presentation that reaches every level of health literacy, and taking it into familiar settings in medically underserved communities, we enhance patient understanding of breast cancer through the following:

- emphasizing early detection through routine screenings, as well as explaining the guidelines for screening;
- discussing how genetics, family history, and lifestyle may increase risks;
- demonstrating some signs and symptoms patients can watch for;
- explaining how staging occurs and how doctors use it in treatment; and
- exploring the different classes of medication used in the fight against breast cancer.

The presentation introduces personalized medicine, and how each patient can work with their healthcare providers to tailor a treatment plan that fits their lifestyle and targets their specific cancer. A short pre-presentation survey ascertains these patients’ baseline knowledge regarding breast cancer, while a post-presentation survey determines whether the presentation met its goals – whether the attendees gained knowledge in areas they did not previously understand. By increasing patient knowledge regarding breast cancer, we empower them to become active participants in their healthcare, giving them the confidence in choosing personalized treatment strategies. Additionally, knowledge empowers patients to share information with others who might be impacted, particularly friends and family members. Presenting the material with pre- and post-presentation surveys enables us to measure the change from baseline in patient knowledge gained by participants.

Results: Significant improvement from baseline occurred in all topics presented, including: causes of breast cancer; disease inheritability; the importance of screening (including screening guidelines); risk factors associated with breast cancer; potential signs and symptoms of disease; and current treatment options. The majority of attendees reported gaining knowledge, whether they were breast cancer naïve, or multiple-episode survivors. Nearly every patient reported feeling confident to take a more active role in their future healthcare, including taking active roles in choosing personalized treatment plans.

Discussion: Pharmacists are highly trained in the pharmacokinetics, medicinal chemistry, and pharmacology of medications. Within public health, pharmacists have a vital role in disease state management, and community pharmacists are on the frontline when promoting healthcare. Promoting breast cancer education throughout our communities is a logical role for pharmacists. By utilizing pharmacy students as presenters and developing the program to include a “train-the-trainer” workshop, the program material will remain current, and pharmacy students will be provided with educational opportunities in promoting public health.

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Category: Social Science
RESULTS OF A PERINATAL EDUCATION SURVEY
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Abstract

Background and Significance: Health literacy, the degree to which people have the capacity to obtain, process and understand basic health information to make appropriate health decisions, has a significant impact on antenatal care. Problems with health literacy are common and are associated with poor outcomes. Those with inadequate understanding of the education presented have less knowledge about their medical conditions and treatment, worse health status, and a higher rate of hospitalization. This study aimed to investigate patients’ recall of routine perinatal education during prenatal visits and their comprehension of routine perinatal education.

Methods: Exempt Institutional Review Board review was obtained. Patients presenting for prenatal care at a university-based resident clinic and private practice clinics in the area were invited to complete a de-identified survey. Survey questions were designed to obtain basic demographic information such as age, race/ethnicity, number of prior pregnancies, level of education completed, and type of health care insurance. Remaining survey questions assessed patient recall of prenatal patient education provided in the clinic, basic understanding by the patient, and patient preferences for receiving education in the office. Statistical analysis was performed using Chi Square and Fisher’s Exact Test tables.

Results: 184 out of 205 surveys were available for analysis. Due to missing values in some of the characteristics, the sample sizes vary for different variables. Of those surveyed 52.17% self-identified as African American, 39.13% as Caucasian, and 4.89% as Hispanic. Highest levels of education completed were some high school 11.48%, high school graduate 34.43%, college 28.42%, technical school 18.03%, and graduate or professional school 7.65%. Of the perinatal educational parameters evaluated, 45.86% reported being offered the flu vaccine, 49.72% reported discussion of weight gain recommendations, 69.40% reported discussion concerning exercise parameters, 73.22% reported discussion of labor precautions, 84.07% reported discussion of fetal movement monitoring, 85.71% reported discussion of the importance of breast feeding, and 59.78% reported discussion of neonatal care following discharge. 71.88% indicated that the flu vaccine was safe in pregnancy and 42.50% acknowledged the increased risk of hospitalization with flu in pregnancy. 84.83% of patients reported that weight gain was based on individual body mass index (BMI). 91.72% of patients reported that exercise should occur 30 minutes on most days of the week. 81.05% indicated that they should present for evaluation with contractions every 2-5min for 1-2 hours. 66.09% responded they should be evaluated for decreased fetal movement if they did not have 10 fetal movements in 2 hours. Only 58.08% of patients responded they should breastfeed exclusively for the first 6 months and then add solids. 91.67% of patients indicated that infants should sleep on their backs. 74.14% of patients responded that mood changes after delivery are normal and typically resolve within 2 weeks. The majority (56.88%) indicated that seeing the same physician throughout their pregnancy would improve their education/understanding.

Discussion: Based on patient recall in this survey, many key components of perinatal education are not routinely discussed at prenatal visits. Of the topics discussed, patient understanding is often an issue. Further research will need to be conducted to see if educational interventions can improve patient comprehension and pregnancy outcomes.

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Category: Clinical / Oral presentation
MORPHOMETRIC ANALYSIS OF THE PEDIATRIC CERVICAL SPINE

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Abstract

Objective: Our understanding of pediatric cervical spine development remains incomplete. The purpose of this analysis is to quantitatively define cervical spine growth in a normal population of children.

Methods: A total of 1,458 eligible patients were identified from children greater than one year and less than 18 years of age who underwent a cervical spine CT scan at our institution. The patients were separated by gender and age in years into 34 groups. Following this, patients within each group were randomly selected for inclusion until a target of 15 patients in each group had been measured. Linear measurements were performed on the midsagittal image of the cervical spine. 23 unique measurements were obtained for each patient.

Results: Our data show that pediatric spine growth continues into the teen years for the axis, atlas, sub- axial vertebrae, intervertebral disks as well as the total spine length. The C2 body is the largest single segment contributor to vertical growth but growth of the subaxial spine is also substantial, even into the teen years. The overall vertical growth of the cervical spine throughout childhood is dependent not just on individual vertebral body growth as well as vertical growth of the disk spaces. Most canal diameter growth occurred very early in life, especially in the subaxial spine.

Conclusions: These morphometric changes should be taken into account when evaluating younger patients for potential surgical intervention, as well as to use as a basis for comparison to surgical outcomes following fusion.

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PRESENCE OF BLEEDING DISORDERS AND MENORRHAGIA IN A HEMOPHILIA CENTER POPULATION

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Abstract

Background and Significance: Menorrhagia is a relatively common complaint amongst young healthy women. Menorrhagia has been defined as greater than 80 cc blood loss during a menstrual period. Methods to quantify menstrual blood loss are somewhat awkward, not easily reproducible and clinicians may have to rely on patient reporting to determine the extent of bleeding. This is a much more subjective estimate. Many younger women and adolescents may be uncomfortable discussing these issues with their doctor. Therefore, the incidence of menorrhagia may be underestimated. Women with bleeding disorders have been shown to have a greater degree of menorrhagia than the general population. Many women with bleeding disorders are diagnosed when they experience menorrhagia with their first or subsequent periods, sometimes resulting in severe anemia requiring hospitalization or transfusions. Bleeding disorders may be acquired or inherited and may be lifelong. Examples of acquired disorders would be thrombocytopenia associated with other diseases such as lupus or with chemotherapy and diseases primarily affecting the platelets such as acute immune thrombocytopenic purpura (ITP). Examples of inherited disorders would be von Willebrand disease (vWd), primary platelet disorders or congenital factor deficiencies. Many women with menorrhagia are referred to a Hemophilia Treatment Center (HTC) for evaluation of an underlying coagulation problem as the cause of their menorrhagia and for therapy. We conducted a retrospective chart review of our HTC’s population with menorrhagia.

Methods: A retrospective chart review searching for females seen at least once in our HTC in the last 10 years with the ICD-9 codes for menorrhagia and either coagulations defect NOS, primary thrombocytopenia or qualitative platelet defect. This was done using the existing Centricity® Electronic Medical Record (EMR) that has been used in our clinic over that time period. Duplicate names, patients with acquired disorders, those undergoing or recently completing chemotherapy and those with acute ITP were excluded.

Results: Using the above criteria, a total of 25 women were identified with menorrhagia and a primary coagulation defect. The average age was 22.4 years with a range of 16-33 years presently and the youngest presenting age was 11 years. Diagnoses included vWd (12), chronic primary thrombocytopenia (5), Glanzmann Thrombasthenia (GT) (3), factor FVII deficiency (FVII) (3) and coagulation defects NOS (2). There were 2 sibling pairs in the vWd patients but none of the other patients were related.

Discussion: Other studies have shown an increased prevalence of bleeding disorders in women experiencing clinically significant menorrhagia. The most common diagnoses have been reported as vWd, factor XI deficiency and qualitative platelet disorders. Our population showed that FVII deficiency and chronic primary thrombocytopenias were the next most common after vWd. With an estimated prevalence of 1% of the population it would be expected that vWd may have a high prevalence in women with menorrhagia. The prevalence of FVII deficiency is approximately 1:500,000 and that of GT is roughly 1:1 million making this finding surprising, especially given that none of those patients were related. Also, the primary chronic thrombocytopenias were unclassified and are likely a heterogeneous group but were included as menstrual symptoms were the primary complaint. Limitations of this analysis include its retrospective nature, the inherent limitations of the EMR and the small sample size. However, this and other similar reviews continue to show that menorrhagia in adolescents and young women, whether it is the initial or a subsequent symptom, should prompt practitioners to consider evaluating for a bleeding disorder or referring the patient to an HTC for the same.

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Category: Clinical Science
METFORMIN IMPAIRS RHO GTPASE SIGNALING AND INHIBITS THE SURVIVAL AND MIGRATION OF NEUROBLASTOMA CELLS

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Background and Significance: Neuroblastoma, the most common malignant childhood cancer of the postganglionic sympathetic nervous system, is derived from the neural crest cells during embryonic development. Initially, it develops in the adrenal gland and metastasizes to various body organs. It is responsible for 15% of all cancer deaths in children younger than 15 years. Despite the standard therapy for advanced disease, the mortality rate remains high in children with neuroblastoma. Hence, discovery of novel therapeutic agents and identification of molecular targets are needed to treat children with neuroblastoma. In the present study we tested if anti-diabetic drug metformin (N', N'-dimethylbiguanide) has anti-survival and anti-metastatic effects against neuroblastoma.

Methods: Human neuroblastoma cells of different genotypes (N-myc nonamplified SH-SY5Y cells, and N-myc amplified SK-N-BE(2) cells) were used to test the anti-cancerous activity of metformin in in vitro and in vivo systems. Metformin (1, 10 and 20 mM) was used to assess cell survival, whereas 0.1, 0.5 and 1 mM metformin concentrations were tested in cell migration assays (wound healing, and matrigel-transwell assays). Activation of Rho GTPases (RhoA, Rac1 and Cdc42) was determined by Glutathione-S-transferase (GST)-pull down assays. Adenovirus-infected cells with constitutively active or dominant negative forms of Rho GTPases were used to further verify the metformin effects on Rho GTPase signaling. For in vivo studies, subcutaneous neuroblastoma xenografts were generated in six-week-old athymic nude (nu/nu) mice. When tumor volume reached ~100 mm³, metformin (50, 100 and 250 mg/kg) was given daily by oral gavage. Tumor volume was measured on every fourth day. At tumor of ~1200 mm³ in controls, mice from all groups were euthanized. Tumors were collected, photographed, fixed in 4% paraformaldehyde or snap frozen in liquid nitrogen for biochemical and histo-chemical analyses.

Results: Our studies demonstrated that metformin induced apoptosis via activation of caspase-3 in neuroblastoma cells and in tumors generated in xenograft mice model of human neuroblastoma. At dose of 100 and 250 mg/kg, metformin inhibited the growth of tumors. In these tumors, metformin activated Rac1 and Cdc42, and inhibited that of RhoA. The inhibitors of Rac1 or Cdc42 as well as dominant negative forms of Rac1, Cdc42, and constitutively active form of RhoA protected cells from metformin-induced apoptosis. Addition of inhibitors of JNK, Rac1, and Cdc42 attenuated the cytotoxic effects of metformin. We further observed that metformin at lower concentrations (0.5 and 1 mM) inhibited the migration/invasion of neuroblastoma cells (as revealed by wound-healing and migration/invasion assays). The reduced enzymatic activity of matrix metalloproteinase-9 and -2 in metformin-treated cells further confirmed the anti-migratory effects of metformin. These in vitro and in vivo studies confirmed the role of Rho GTPase signaling in metformin inhibited survival and migration of neuroblastoma cells.

Conclusion: As metformin is a cost-effective and non-toxic drug, the observed anti-cancer effects of metformin suggested that it is a potential therapeutic drug to treat children with neuroblastoma.

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Presented in ASBMB annual meeting “Experimental Biology-2015” at Boston, MA (March 29- April 01, 2015).
USING BRFSS DATA TO ASSESS BREAST AND CERVICAL CANCER SCREENING AT VARIOUS GEOGRAPHIC LEVELS IN SOUTH CAROLINA
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Abstract
Background and significance: Approximately 125 and 8 (per 100,000 population) new cases of breast and cervical cancer, respectively, were seen in South Carolina between 2008 and 2012. The incidence rates of both of these forms of cancer were higher than what was seen nationally for the same time period. Screening for these cancers is pervasive in routine medical care. The purpose of this analysis was to see if where a woman lives in South Carolina affects her likelihood for getting screened for breast or cervical cancer, while adjusting for covariates. Further, we wanted to demonstrate the level of geographic data that is available via our data source, the South Carolina Behavioral Risk Factor Surveillance System (SC BRFSS). SC BRFSS is a CDC-funded, random-digit dialed cross-sectional survey conducted annually in South Carolina since 1985.

Methods: Data collected through the SC BRFSS was obtained for 2012 and 2014. Logistic regression was utilized to investigate the association between whether or not a woman was screened for breast or cervical cancer and where in South Carolina she lived. Three levels of geographic location were used: four large regions (Midlands, Upstate, Pee Dee, Low Country); nine smaller regions (made up of 4-8 counties); county. Both unadjusted and adjusted models were built for predicting breast and cervical cancer screening. The following potential confounders of this association were adjusted for: BMI category; physical inactivity; smoking status; alcohol consumption; race/ethnicity; annual household income; health insurance coverage status; education; general health status; age.

Results: The association between whether or not a woman was screened for breast or cervical cancer and where in South Carolina she lived was not significant for any geographic level regardless of adjustment for potential confounders. For each geographic level and form of cancer, age was positively significantly associated with the odds a woman would get screened.

Discussion: One of the limitations of this analysis is the lack of information on family history of cancer, oral contraceptive use, and whether or not the screening in question actually took place while she lived in South Carolina. Another limitation of this analysis arises from the methodology of BRFSS. BRFSS is an important tool for public health surveillance, but it may not be the best data source to explore the association of interest due to the potential for self-report bias. This analysis did demonstrate the level of geographic information available via SC BRFSS. Further study utilizing other statewide data could be done to explore this association and to identify high priority geographic areas for breast and cervical cancer screening in South Carolina.

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OVERCOMING RESISTANCE TO HER2-TARGETING DRUGS USING CDK8 INHIBITORS
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Abstract
Background and Significance: The HER2 proto-oncogene is overexpressed in approximately 25% of breast tumors and is associated with an aggressive phenotype and poor clinical outcome. Targeted therapies such as trastuzumab (Herceptin®), a monoclonal antibody which targets the extracellular domain of HER2, and lapatinib (Tykerb, Tyverb ®), a small molecular weight tyrosine kinase inhibitor targeting the intracellular kinase domain of HER2 have significantly improved the prognosis for HER2 positive breast cancer patients. However, resistance to these agents is a significant clinical problem. We have previously found that resistance to HER2-targeting drugs involves increased activity of the phosphatase PP2A¹. PP2A was reported to stimulate the kinase activity of CDK8², a transcription-regulating kinase that in contrast to some other members of the CDK family does not regulate cell cycle progression but serves as a positive transcriptional regulator of many cancer-associated transcription factors. Thus CDK8 may play a role in resistance to HER2-targeting therapies.

Methods: We have generated the first selective small-molecule inhibitors of CDK8 and its paralog CDK19 and found that higher CDK8 expression is associated with shorter relapse-free survival (RFS) in breast cancer³. These correlations were the strongest in patients who underwent systemic therapy after surgery but weak in untreated patients, suggesting that CDK8 impacts the failure of adjuvant therapy⁴. In addition increased CDK8 expression has been implicated in mammary carcinogenesis and associated with breast cancer progression⁵. In the present study, we have investigated the role of CDK8 in resistance to HER2-targeted therapies in breast cancer.

Results: We have found that an optimized CDK8/19 inhibitor Senexin B has a synergistic growth-inhibitory effect in combinations with an anti-HER2 monoclonal antibody (a biosimilar of trastuzumab) and with the HER2/EGFR small-molecule inhibitor lapatinib. These synergistic effects were observed in all HER2+ breast and colon cancer cell lines tested so far, including those that are either sensitive to HER2-targeting drugs or non-responsive to these agents due to innate or acquired resistance. CDK8 inhibition synergizes with HER2 inhibitors in both sensitive and resistant HE2R+ve cells and can prevent the emergence of HER2-targeted drug resistance: combination of CDK8 and HER2 targeted therapies represents a unique treatment option for HER2+ve patients. Furthermore, combining lapatinib with Senexin B inhibited the development of de novo resistance to lapatinib.

Conclusions: Taken together these results suggest that combining anti-HER2 and anti-CDK8 therapies is a rational potential treatment for HER2+ cancers, which may overcome both innate and acquired resistance to HER2-targeting drugs.


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THE IMPACT OF CENTERING PREGNANCY™ GROUP PRENATAL CARE ON PATIENT SATISFACTION

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Abstract

Background: CenteringPregnancy group care begins after the initial prenatal assessment and continues with 9-10 two-hour sessions for 8-12 women with similar due dates. Research shows decreased preterm births, increased breastfeeding rates, and increased patient satisfaction. Medical providers assess patients individually in a private setting within the group space and then facilitate discussion and education with the entire group. Centering care promotes active participation, lasting relationships, and support among participants. University Specialty Clinics-Obstetrics and Gynecology is a private faculty practice certified by the Centering Health Institute (CHI) and is part of the South Carolina CenteringPregnancy Expansion Project. The SC CenteringPregnancy Expansion project is supported by the March of Dimes and the SC Birth Outcomes Initiative. Prior to returning to traditional prenatal care for the final month of pregnancy, patients are asked to complete a CHI evaluation form. The aim of this study is to evaluate patient satisfaction with CenteringPregnancy group prenatal care at this university faculty practice and to compare perspectives of nulliparous women to multiparous women who participated in the program.

Methods: A retrospective review was conducted of CHI evaluation forms completed anonymously by patients who participated in CenteringPregnancy group prenatal care from July 2013 to August 2015. Data were analyzed using ChiSquare test and Fisher Exact test. Institutional Review Board determined this project did not meet criteria for federal research regulations protecting human subjects.

Results: 87 evaluation forms were available for analysis. 75% of patients were nulliparous. Satisfaction reported by patients varied from 80-94% in the following educational topics: common changes in pregnancy, nutrition, exercise, pregnancy problems, breastfeeding, sexuality/family planning, family relationships, family violence/abuse, baby care/parenting, and emotional changes/depression. 94% of patients liked group prenatal care and in fact, 95% of patients felt comfortable having their assessments in the group setting. 88% felt prepared for labor and parenting. 58% planned to keep in touch after their Centering experiences. Satisfaction was consistent among these 17 Centering groups. There was no difference in overall satisfaction rating between nulliparous and multiparous patients.

Conclusion: Group prenatal care creates a supportive and comfortable healthcare environment as endorsed by the high satisfaction scores in our study. Similar results have been demonstrated in previous studies.

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Category: Clinical / Oral presentation
BREAST CANCER AND ALL-CAUSE MORTALITY AMONG ECONOMICALLY DISADVANTAGED WOMEN AGED 47 TO 64 YEARS: COMPETING RISK ANALYSIS AND COX PROPORTIONAL HAZARDS MODEL

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Abstract

Background and Significance: There are large racial disparities between breast cancer mortality and all-cause mortality among African American (AA) and European American (EA) women, especially in the southeastern part of the US. Best Chance Network (BCN) provides unique services to underserved populations which may help reduce existing health disparities. Studying differences by BCN participation, or for low-income groups, may provide us with insight into helping these communities. We investigated mortality probabilities from breast cancer, other causes, and all-causes for women in the Best Chance Network and the general population of South Carolina.

Methods: This study examined mortality among BCN and non-BCN participants, as well as by racial composition, in relation to treatment type received, stage of disease, time to treatment, education, and age. Hazard ratios and 95% confidence intervals were calculated for BCN- and race-stratified competing risk models and stage-stratified Cox proportional hazard models.

Results: Among BCN participants, stage II (p =0.0233) and stage III (p <.0001) disease were significant predictors of increased risk of breast cancer mortality. Non-BCN participants were at an increased risk of breast cancer death from stage I, II III disease (all p<.0001), as well as year of diagnosis, treatment type, and race (p < 0.05). Race was non-significantly related to breast cancer and other cause mortality among BCN participants, whereas non-BCN AA women had a higher risk of death for both breast cancer and other causes as compared to their EA counterparts (HR: 1.5, 95% CI: 1.3, 1.8 and HR: 2.0, 95% CI: 1.5, 2.7, respectively). Moreover, increased age and cancer stage increased the risk of other cause mortality (p <0.05) and among patients with in situ, I and stage II cancer stage, AA women had increased risk of all-cause mortality as compared to EA women (p < 0.05).

Discussion: BCN participation has beneficial effects on an underserved population and similar programs may be important nationwide to address for larger disparities that would persist among noninsured populations.

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Category: Clinical Science
NEW SOLID-STATE 4H-SiC X-RAY DETECTOR FOR HIGH RESOLUTION DIGITAL MAMMOGRAPHY
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Abstract
Background and Significance: Early detection of breast cancer is essential in reducing mortality rates among the population by receiving treatment early which is only possible through a proper breast cancer screening program. Mammography is an important diagnostic tool in breast cancer screening; however, there are concerns regarding increased radiation dose due to the hard x-rays typically used in the test. In response to the concern raised by both physicians and patients, promising new technologies have been developed which include low dose mammography. The use of soft x-rays is one interesting approach, among several strategies, aimed at lowering radiation dose. However, studies and imaging using soft x-rays would not be possible without very high resolutions detectors. Schottky barrier radiation detectors based on n-type 4H-SiC have been fabricated in our laboratory and evaluated for low energy x-ray detection and found to be highly sensitive to soft x-rays in the 50 eV to 60 keV range. Since it is a solid-state device, it is very compact in a pixilated array to provide good compatibility with the standard size mammography cassettes. In addition we are designing a controller which can be retrofitted to the many existing mammography x-ray machines already being used for early breast cancer screening.

Methods: The silicon carbide (SiC) semiconductor sensor we are developing provides (1) high bandgap (3.27 eV) implying low leakage currents of junctions which is needed for low noise operation at room temperature; (2) high critical breakdown field (2MV/cm) allowing operation at high internal electric fields, minimizing carrier transit time and trapping probability; (3) high carrier saturation velocity (200 µm/ns) required for fast signals; and (4) low electron-hole pair generation energy (7.3 eV/EHP) beneficial for efficient x-ray detection. Our group at USC, in collaboration with Los Alamos National Laboratory, and SUNY Upstate Medical University, NY, is developing the prototype detectors which resulted in the invention of highly sensitive x-ray detectors suitable for phantom and tissue samples.

Results: Our developed detectors are composed of fully packaged small configurations while simultaneously being extremely sensitive. We have designed, fabricated, and tested different configurations of 4H-SiC detectors at USC. Pulse height spectrum for 241Am radio-isotope (~60 keV) demonstrated energy resolution ~ 2.1%. These detectors were also evaluated at the national synchrotron light sources (NSLS) at BNL. Our sensor chip showed significantly improved response in the mammographic x-ray range (28-38 keV) compared to commercial off the shelf (COTS) detectors.

Discussion: When the fabrication and prototype design is optimized through testing and evaluation, we expect to have a full field imaging mammography system with much higher resolution and improved detection sensitivity than existing conventional CsI/a-Si or a-Se/TFT-read out based digital mammographic detectors. We expect much better Detective Quantum Efficiency (DQE) at significantly reduced radiation dose to glandular breast tissue and lower manufacturing cost, a compelling story for hospitals and clinics. Additionally, these innovative detectors would find applications in chest radiography, brain imaging, Homeland security, nuclear non-proliferation, and high energy astrophysics.

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EFFECT OF ARSENIC ON TYPE 2 DIABETES
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Abstract
Background and Significance: Type 2 diabetes (T2D) affects approximately 364 million individuals worldwide including ~8% of the United States population, with this number expected to rise. Many studies demonstrate that obesity contributes to the development of T2D, and chronic inflammation in adipose tissue is a complication associated with obesity. There is increasing evidence correlating elevated levels of arsenic in drinking water and increased incidence of T2D. The link between arsenic exposure and T2D in the United States is still not well established; however a clear association has been found in Bangladesh and Taiwan where exposure levels are as high as 1000μg/L. While these studies have established a correlative affect between arsenic exposure and T2D, a direct mechanism linking the two is still elusive. Because of this, we propose to examine the effects of arsenic on the immune system in a diabetic mouse model to determine whether arsenic-induced changes in inflammatory markers could induce a shift towards a diabetic state.

Methods: Mice (Leptin receptor deficient – db/db, heterozygous – db/+, and wild-type) were exposed to low dose arsenic trichloride (50ug/kg) every other day by oral gavage, from 4-12 weeks of age. Every 4 weeks we evaluated glucose tolerance (oral glucose tolerance test, OGTT) and body composition (DEXA scan). Mice were euthanized at 12 weeks, spleens and adipose tissue (reproductive, subcutaneous and visceral) were harvested for RNA isolation and histology.

Results: Over the 8 week exposure period, we saw an increase in indicators of obesity in the arsenic-exposed group. That is, total body weight and percent body fat were increased in the female and male heterozygous mice. However, we did not find significant differences in glucose tolerance in these mice. When examining reproductive fat in male heterozygotes we saw an increase in size in adipocytes, as well as a higher number of areas of inflammation in those treated with arsenic.

Discussion: These preliminary data suggest that while the physiological responses may not yet be indicative of T2D, arsenic exposure increases risks for obesity and inflammation. Interestingly, there were sex-dependent differences in these responses to arsenic. We will continue to evaluate these changes by examining adipokines produced by adipose tissue, including anti-inflammatory adiponectin as well as changes in systemic inflammation observed in the spleen.

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RNA RETENTION AND EDITING PARASPECKLE COMPONENTS ARE NECESSARY FOR MAINTENANCE OF GENOME INTEGRITY

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Abstract

Background and Significance: Accumulation of DNA damage resulting from cellular stressors is considered one of the contributing factors to cancer. Double-stranded DNA breaks are one of the most severe forms of DNA damage and drive chromosomal instability. An error-free pathway called homologous recombination (HR) uses a homologous template to repair the double-stranded DNA breaks. RAD51D, an ovarian cancer susceptibility protein, with the aid of a complex searches for a homologous template that will be used in the repair. Deficiencies in RAD51D have lead to increased sensitivity to DNA damaging agents, such as cisplatin. However, mutations in the homologous recombination pathway allow the development of resistance to cancer treatments. Discovering novel interaction partners of RAD51D will allow further elucidation of RAD51D’s role in HR and reveal possible novel therapeutic targets. From a proteomics study, we recently identified two essential paraspeckle components, SFPQ and NONO, as novel interaction partners with RAD51D. Paraspeckles are novel nuclear organelles currently known for retention of mRNAs. Core components of the paraspeckle consist of a long-noncoding RNA, NEAT1 and the Drosophila Behavior Human Splicing (DBHS) family of proteins SPFQ/PSF, NONO/P54NRB, and PSPC1. Altered expression levels of these proteins have been detected in breast and ovarian cancer. Determining their role in homologous recombination could provide novel therapeutic targets used to treat breast and ovarian cancer.

Methods: Initial interaction of NONO was identified by mass spectrometry. Co-precipitation in an E.coli expression system used purified His-tagged RAD51D, RAD51C, and NONO was analyzed by immunoblot using an anti-His antibody. Yeast two-hybrid assay was also used to detect NONO’s interaction with RAD51 paralogs and specify the RAD51D domains of interaction. Paraspeckle quantity was analyzed in transiently transfected Hela cells using the Mirus TransIT-LTI system or by Hela cells probed with a SFPQ or NONO antibody and fluorescent secondary antibody. Chromosomal aberrations were analyzed in Rad51d+/+, Trp53-/-, and Rad51d-/-, Trp53-/- mouse embryonic fibroblasts with NONO expression transiently decreased by siRNA. Sensitivity to DNA damaging agents were analyzed in the absence and presence of NONO in in Rad51d+/+, Trp53-/- and Rad51d-/-, Trp53-/- mouse embryonic fibroblasts by MTT cell survival assay. Gene expression differences of NONO in human breast cancer cell lines was analyzed by quantitative real-time PCR and expression was normalized to normal tissue.

Results and Conclusions: Co-precipitation, used to confirm interaction detection by mass spectrometry pulled down NONO in both RAD51D AND RAD51C eluates. In the yeast two hybrid assay, NONO’s interaction was confirmed with RAD51D and RAD51C. The yeast two hybrid assay narrowed the region of interaction to the middle and carboxy terminus of RAD51D. NONO’s necessity in the paraspeckle suggested the possibility that the paraspeckle may be involved in DNA damage. Paraspeckle quantity was shown to decrease slightly, but significantly upon treatment with etoposide. It showed opposite effects upon treatment with a crosslinking agent, cisplatin. It suggests that paraspeckles may have different effects dependent upon the type of DNA damage. An increase in chromosomal aberrations and sensitivity to DNA damaging agents was seen in the absence of NONO. Altered expression levels were detected in breast cancer cells in comparison to normal tissue. The interaction of NONO with DNA repair proteins, RAD51D and RAD51C, along with increased chromosomal instability and sensitivity to DNA damaging agents in its absence suggest a necessity for it in DNA repair and maintaining genomic stability. Future work will elucidate the mechanism of NONO and RAD51D in homologous recombination.

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Category: Basic Science
ENHANCING CANCER CHEMOSENSITIVITY BY TARGETING THE RAD51D OVARIAN CANCER SUSCEPTIBILITY GENE
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Abstract
Background and Significance: Current chemotherapy treatments for ovarian cancer are effective initially; however, drug resistance is a common occurrence and adds to the increased risk of relapse and mortality. Poor prognosis for ovarian cancer patients is due, in part, to tumors developing resistance to DNA damaging chemotherapy treatments. Approximately 50% of ovarian cancers carry mutations in essential DNA damage repair genes, such as BRCA1, BRCA2, and the recently identified RAD51D. As the fourth member of the RAD51 family of proteins, RAD51D is essential for the accurate repair of double strand breaks through the homologous recombination (HR) pathway, and mutations in RAD51D have been strongly associated with an increased risk for ovarian cancer, but not breast cancer. Post-translational modifications are also essential in promoting accurate DNA damage repair and ubiquitination-specific modifications are key orchestrators of HR. Our previous studies demonstrated that RAD51D is ubiquitinated by the E3 ligase RNF138. Interestingly, cells deficient in RNF138 are also sensitive to DNA damaging agents. This suggests that RNF138 plays a role during HR in connection with RAD51D. The function of this post-translational modification in HR is not completely understood but has the potential to provide an alternative route by which RAD51D can be disrupted in cancer cells, thus expanding the pool of potential ovarian cancer treatment options. By understanding the role of this interaction within the HR pathway, insights into potential drug targets will be gained, ultimately leading to lower dose alternatives for current chemotherapy treatments for ovarian cancer.

Methods: Rad51d-deficient mouse embryonic fibroblasts were transfected with plasmids expressing either wild-type RAD51D, a RAD51D lysine mutant, or empty vector. The RAD51D lysine mutants each have a single lysine to arginine amino acid change at one of the thirteen lysine residues. The transfected cells were split into two plates and colony forming assays were performed by treating one plate with 200 ug/mL Hygromycin B and the other plate with 200ug/mL Hygromycin B and 4 ng/mL mitomycin C. Fourteen days after starting treatment, the colonies were counted and the percent survival was calculated. Each RAD51D lysine mutant will also be used in in vivo ubiquitination assays by transfecting each plasmid with HA-tagged ubiquitin, pulling down the RAD51D protein using immunoprecipitation, and immunoblotting for ubiquitin. Yeast-two-hybrid analysis will also be performed to determine if the lysine to arginine change affects protein-protein interaction between RAD51D and RNF138.

Results: The colony forming assay data suggest that the K298R mutant results in decreased RAD51D function in response to DNA damage compared to the wild-type RAD51D.

Discussion: Elucidating the function of the interaction between RAD51D and RNF138 in DNA damage repair has the potential to provide a route by which HR-deficiency can be induced in HR-proficient cancer cells to increase the chemosensitivity of these cells. These data and further studies will also provide new ways to diagnose ovarian cancers, by identifying RAD51D mutations, and to increase the effectiveness of ovarian cancer treatment through combination therapies that include DNA damaging drugs.

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THE IMPACT OF NAVEGANTES PARA SALUD ON ACCESS TO PRIMARY CARE AMONG HISPANIC WOMEN AND CHILDREN

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Funding Acknowledgement: Centers for Medicare and Medicaid Services, Grant 1HOCMS330895

Abstract

Background and Significance: Timely and appropriate access to primary care is essential to both the maintenance and improvement of population health. In the United States, federally qualified health centers (FQHCs) provide primary care services for underserved communities, which include Hispanics with limited-English-proficiency. Community health workers, known as promotores de salud in Spanish, are recognized as an essential link between underserved communities and the formal healthcare system.

Methods: The aim of this research was to develop, implement, and evaluate an innovative hybrid community health worker/patient navigator model designed to improve access and utilization of community health clinics among pregnant Hispanic women and their children in the South Carolina Midlands. We selected and trained three bilingual, native Spanish speakers to serve as Navegantes para Salud. Each Navegante was assigned to paired obstetric and pediatric community health clinics. During the 11-month intervention, Navegantes enrolled 389 pregnant Hispanic women and 598 dependent children. The Navegante intervention included appointment reminder phone calls, referrals to other health and social services, and assistance with hospital registration. Adults completed an initial intake survey. To test the impact of the intervention we chose indicators of appropriate utilization of services and follow-up (e.g., adequate pre-natal care, timely child immunizations) and compared participants to a historical comparison group from the FQHC matched on age groups, gender, Hispanic ethnicity, pregnancy status, and payer source.

Results: Participants in the Navegante intervention were more likely to attend scheduled clinic appointments and had fewer missed appointments (p<.05). Intervention women had higher Kotelchuck scores (M=2.68), indicating higher likelihood they received appropriate prenatal care than the comparison group (M=2.15; p<.05). Intervention children had lower rates of Emergency Room visits, were more likely to have an immunization visit, and had higher rates of Medicaid coverage than comparison children, although differences were not statistically significant. Process evaluation data indicated the need for personalized orientation to emergency Medicaid for pregnant Latinas and the importance of an on-site Medicaid case worker.

Discussion: Although most participants initially reported being “satisfied” with the FQHC services, they also paradoxically noted they would “not recommend” the clinic to family or friends. In their personal communications with the Navegantes many disclosed frustration with long waits, language barriers, and other access difficulties. During the intervention, staff came to recognize the Navegante role was not limited to overcoming language barriers and would be of value to improving access among other patient groups. Further validation came when FQHC administrators decided to adopt the model and offered regular employment to the 3 bilingual Navegantes after the conclusion of the research project.

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HIGH HOSTILE WOMEN EVIDENCE DIMINISHED CAPACITY TO PROCESS COGNITIVE STRESS WHEN COMPARED TO LOW HOSTILE WOMEN
Alana Rosa, Cristina Blanco, Michael Doster, Angela Neal and Alissa K. Holland

Background and Significance: Regulatory control of emotions and expressive fluency (verbal or design) is associated with the frontal lobes (Holland, Carmona, & Harrison, 2012). Fluency has been widely used in neuropsychological assessment of executive function (Lezak, 1995). Verbal fluency has been demonstrated to require differential activation of the left frontal lobe (Gladsjo et al., 1999; Kozora & Cullum; 1995) whereas design fluency has been demonstrated to require activation of the right frontal lobe (Ruff et al., 1994). The construct of hostility includes deficits in executive function, and increased experience of negative emotions. It has been well documented that there is a relationship between hostility and frontal lobe function. High hostile individuals have reliably demonstrated a diminished ability to maintain stable levels of right lobe activation under dual task demands (Holland et al., 2012; 2014). In a study examining performance differences on a memory task where participants were requested to learn positive and negative word lists, Mollet and Harrison (2007) found that high hostile women learned fewer words for both lists relative to low hostile women. For the current research, it was predicted that high hostile women will evidence reduced ability to complete design and verbal fluency tasks relative to low hostile women. Moreover, high hostile women were expected to evidence increased heart rate (HR) and systolic blood pressure (SBP) upon completion of these tasks.

Methods: To examine differences in fluency in high and low hostile women, 47 participants (n=20 high hostile women, n=27 low hostile women) were randomly selected to complete neuropsychological tasks that recruited resources from different hemispheres. Upon coming into the lab, each participant completed the Ruff Figural Fluency Task (RFFT), a neuropsychological task widely used to measure right hemisphere activation, and the Controlled Oral Word Association Task (COWAT), a neuropsychological task widely used to measure left hemisphere activation. The order of the test was counterbalanced between subjects. Heart rate (HR) measures were also taken before and after completing the RFFT and COWAT.

Results: A Hostile x Trial interaction was found (F(4, 180) = 4.78, p = .001), indicating a decrease in perseverative errors made on the COWAT for low hostile women. High hostile women made more perseverative errors in the later trials on the COWAT. This interaction was not seen for perseverative errors made on the RFFT. A main effect for Hostility was found (F(1, 44) = 5.22, p = .02), indicating that high hostile women evidenced a higher heart rate throughout all experimental conditions relative to low hostile women. A Condition x Task interaction was found (F(1, 44) = 4.7, p = .03), indicating that heart rate decreased upon completion of the COWAT and increased upon completion of the RFFT. A potential main effect approaching significance was found for DBP (F(1, 44) = 3.69, p = .06), indicating higher DBP before and after completing the word task when compared to completing the design task.

Discussion: The results provide partial support for the hypothesis that high hostile women would evidence diminished performance on both tasks. High hostile women made more errors on the verbal fluency task, although this difference was not seen for the design fluency task. The main effect for heart rate indicates that high hostile women evidenced increased cardiovascular reactivity relative to low hostile women before and after completion of both tasks. The results provide evidence that high hostile women evidence reduced frontal lobe activation when undergoing cognitive stress.

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TRENDS IN ORAL CONTRACEPTIVE USE BY RACE AND ETHNICITY IN SOUTH CAROLINA AMONG MEDICAID-ENROLLED WOMEN
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Abstract
Background and Significance: Progestin-only contraceptives remain unpopular among both clinicians and women but may be an important alternative for women who are at an increased risk for complications related to the use of combined oral contraceptives. The prevalence of combined oral contraceptive contraindications are more common in the Medicaid population than in the general population. Our study focuses on factors that influence (1) women’s choice of oral contraceptives, (2) the type of oral contraceptive chosen by clinician and/or women, and (3) trends in oral contraceptive use.

Methods: This study is a retrospective, observational study using women enrolled in Medicaid from 2000 to 2013. Logistic regression analyses and were conducted to investigate factors influencing oral contraceptive choices adjusting for potential confounders and trends in pill use.

Results: Progestin-only contraceptive use was strongly related to age (OR: 1.11, 95% CI: 1.10, 1.11) and race (OR: 1.56, 95% CI: 1.43). Despite the non-significant role of menopause and marital status in using an oral contraceptive (yes or no), these variables played a role in the type of oral contraceptive (progestin-only (POC)/ estrogen + progestin (COC)/ POC + COC) women used. Menopausal women were less likely to use POC+COC formulations (OR: 0.29, 95% CI: 0.11, 0.80) and married women were more likely to use progestin-only (OR: 1.28, 95% CI: 1.15, 1.41) and POC+COC (OR: 1.41, 95% CI: 1.29, 1.54) formulations, compared to non-married women. Furthermore, there was an increasing trend in POC use over time, especially among European American women.

Discussion: The current study found that African Americans had a steady decrease in COC use and European American women had a 15% growth rate annually in POC use, which may be due to adverse events related to COC use. Progestin-only pills might be a better alternative to combined oral contraceptive and physicians should focus on identifying the proper population to use this method.

Implications: Progestin-only oral contraceptives serve an important role in reducing unintended pregnancies and have been associated with less detrimental health effects compared to combined oral contraceptives. The public health community should consider whether progestin-only pills are the most appropriate choice for women at high-risk for certain health complications (e.g. heart disease, breast cancer, stroke, venous thromboembolism).

Keywords: oral contraceptives, progestin-only, low-income, women’s health

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Category: Social Science
THE EFFECT OF OVARIAN FUNCTION ON INTERLEUKIN-6 REGULATION OF CACHEXIA-INDUCED MUSCLE WASTING IN TUMOR BEARING MICE
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Abstract
Background and Significance: Cachexia is a wasting condition secondary to many chronic diseases that involves the unintentional loss of bodyweight (>5% over 12 months), and accounts for one-third of all cancer deaths. Cytokine Interleukin-6 has both pro-inflammatory and anti-inflammatory characteristics, and has been implicated in the regulation of cachexia progression with some cancers. Cachexia regulation by IL-6 can be impacted by sex, which may be due to estrogen’s function as an anti-inflammatory agent that can directly regulate IL-6. We examined if ovarian function altered IL-6 regulation of cachexia associated muscle wasting in female tumor bearing mice.

Methods: Female ApcMin/+ mice (MIN), a mouse model of intestinal and colon cancer, underwent ovariectomy (OVX) or sham surgery (SHAM) at 11 weeks of age. At 13 weeks of age, mice underwent intramuscular electroporation of an IL-6 or control vector to over-express systemic IL-6. After sacrifice at 15 weeks of age, immunohistochemistry was performed on distal tibialis anterior to determine types IIA and IIB fiber and cross-sectional area (CSA).

Results: OVX increased muscle fiber CSA compared to SHAM mice. IL-6 over-expression reduced muscle fiber CSA in SHAM mice. Furthermore, CSA was greater in OVX MIN mice compared to OVX+ IL-6 MIN mice. While ovarian function appears to regulate tumor-induced muscle wasting, loss of ovarian function increased IL-6 responsiveness in the tumor bearing mice.

Conclusion: OVX increases CSA in MIN mice, but the addition of IL-6 attenuates these increases, indicating that there is an interaction of ovarian function and IL-6. Future studies need to determine the mechanistic interaction between ovarian function and IL-6 signaling for the progression of cachexia in the female ApcMin/+ mouse.

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Category: Basic Science
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Abstract

Background and Significance: The overall cesarean delivery rates in the United States increased approximately 60% from 1996 through 2009. It has been established that approximately 2/3 of women with a prior cesarean delivery are candidates for a trial of labor after cesarean (TOLAC). Currently, the American College of Obstetricians and Gynecologists recommends offering a trial of labor to most women with one previous cesarean delivery with a low-transverse incision. Counseling should include consideration of individual characteristics that affect the risk of complications associated with TOLAC and vaginal birth after cesarean (VBAC). Most published series quote a 60-80% success rate. Maternal-Fetal Medicine Units (MFMU) Network developed a nomogram for the Prediction of Vaginal Birth after Cesarean Delivery based on information available at admission for delivery. Given that this is a relatively new prediction model, it has never been studied among the population of patients at Palmetto Health Richland Hospital. The study aimed to determine if MFMU Network’s validated VBAC calculator, utilizing information available at admission for delivery, would provide an accurate reflection of successful VBAC among the patient population at our tertiary care center.

Methods: Exempt Institutional Review Board review was obtained. We performed a retrospective chart review of patients who underwent a trial of labor at Palmetto Health Richland Hospital from January 2012 to December 2014. Charts were reviewed to obtain demographic information and data variables required for the VBAC calculator. These variables were then used to calculate the VBAC success rate for each patient. A logistic regression model was used to assess the relationship between VBAC score and delivery mode.

Results: Data from 236 women who underwent TOLAC were entered into the VBAC calculator. The average VBAC score across all three years was 72.5. The percent of women who delivered vaginally was 74.15. After fitting the logistic regression model, we found that with 1% increase in VBAC score, the odds ratio of having a vaginal delivery increases around 5.9%.

Conclusion: The prediction of TOLAC success for the patients at Palmetto Health Richland shows a positive correlation with the MFMU’s VBAC Calculator. This tool may be useful in counseling patients when admitted for TOLAC and in providing patient-specific chance for having a successful VBAC.
AN EVALUATION OF OBSTETRICS AND GYNECOLOGY RESIDENT CLINIC FROM RESIDENTS’ AND PROGRAM DIRECTORS’ PERSPECTIVES

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Background and Significance: Clinic is an integral part of residency training and continues to be an integral part of daily practice after residency. The Accreditation Council of Graduate Medical Education (ACGME) governs residency and states residents are to be in clinic at least 0.5 days per week for at least 30 months through the four years of residency. Many details are left for program specific interpretation. There are few publications of OB/GYN specific clinic-related surveys. There are a total of 245 OB GYN programs in the nation. As of 2014 there are 5,018 OB GYN residents. The purpose of our project is to collect specialty specific responses regarding clinical settings of OB GYN residents in the United States. The data will be used to evaluate our program’s OBGYN clinic experience.

Methods: An anonymous internet based survey was created for residents by an active OBGYN resident and for residency program directors (PD) by the PD of our institution. The project received Institutional Review Board exempt status. The resident survey invitations were initially sent via email listserv to OBGYN residency program coordinators for distribution to their program’s residents. There was minimal response. The protocol was revised to have the survey invitation emailed by our PD directly to PDs listed on the Association of Professors of Obstetrics and Gynecology (APGO) website, a total of 185 programs. 17 were returned as non-valid emails, resulting in a total of 168 recipients. Separate emails were sent to these PDs, one inviting PDs to participate in the PD survey and a second requesting that they forward an email survey invitation to their program’s residents.

Results: 68.6% of programs received the survey. 50 PD responses were returned with 37 completing the survey, representing 15.1% of total PDs in the nation and 22% of the 168 who received the email invitation. 271 resident surveys were returned, representing 5.4% of residents nationally. Regarding resident responses, 30.9% (82) were PGY1 (Post Graduate Year 1), 26% (69) PGY2, 21.9% (58) PGY3, and 21.1% (56) PGY4. Average age was 28 (± 2.5). 89.4% (237) were female and 10.6% (28) male. Residents averaged 7.9 (± 3.2) patients in half day clinic. Per PD responses, patients allowed per PGY4 half day were 9.7 (± 2.99), per PGY2 half day 7.8 (± 2.2), and per PGY1 half day 5.1 (±2.2). There was an average of 2.2 (± 1.1) allowable patient over-books per half day. Per PD responses, 57.1% of residents seem to be moderately satisfied with clinic and 39.8% moderately satisfied with clinic. Top three resident complaints to PDs about clinic included continuity of patients (57.1%) nursing staff (48.6%), and number of patients scheduled (37.1%). 50.4% of residents desired to see more adolescents patients, 30.3% reported the patient mix as appropriate, and 27.5% desired to see more geriatric gynecology patients.

Discussion: The total number of responses for PDs and residents were limited in respect to total numbers nationally. Overall there was general satisfaction with clinic and the number of patient seen; however there is a discrepancy in perception from PDs versus residents. Our own clinic experience mirrors some of the above results, however we are different in the number of patients seen and the presence of a post night float clinic. As we have a dedicated adolescent gynecology rotation, we suspect that our residents obtain more clinical experience than the average resident in pediatric and adolescent gynecology as reported in this survey sample. We hope to use this information to improve efficiency and resident and patient satisfaction in our clinic models.

Contact Information

Category: Clinical / Oral presentation

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Background and Significance: Currently there is no target drug therapy for triple negative breast cancer (TNBC). The FGD1 gene encodes for a guanine exchange factor protein which signals cellular migration; overexpression has been observed in infiltrating and poorly differentiated breast tumors and TBNCs. Our laboratory focused on determining importance of FGD1 expression in invasive tumors. Overexpression FGD1 may play a role in migration and may modulate the development of cancer through the expression of identified cancer genes (HRAS-like suppressor2) HRASLS2 and gamma-aminobutyric acid typeB receptor subunit2 (GABBR2). These genes could potentially be used for early markers of invasive tumors and novel therapeutic targets.

Methods: MDA-MB-231 cells were transfected with short hairpin RNA (shRNA) to knockdown expression of FGD1 and verified using real-time polymerase chain reaction (PCR) analysis assay. Expression analysis was performed per Superscript II protocol. Two controls, total RNA from normal human breast tissue and fetal brain, were used to compare the expression of FGD1. The developing fetal brain expression of FGD1 is high as a positive control and the normal breast tissue served as a negative control, FGD1 expression was normalized using the housekeeping gene Elongation Factor alpha 1 (EEF1A). We verified that the cells were transfected with the shRNA plasmid by using the green fluorescent protein (GFP) signal. Samples were prepared for microarray analysis by harvesting the cells for RNA and reverse transcribing the RNA to generate complementary DNA (cDNA). Microarray detected expression differences in genes between the shRNA transfected cells with loss of FGD1 and wild type breast cancer cells with FGD1 expression. We tested these genes with expression changes to a panel of breast cancer tissue samples which include TNBCs. We also compared these genes with the online cancer database (cbioportal) to confirm the expression changes in a large number of clinical samples (approximately 300 samples).

Results: Potential genes, HRASLS2 and GABBR2, were altered in the FGD1 knockdown cells. HRASLS2 which is involved in the regulation of cellular growth, apoptosis, and differentiation have been shown to be decreased in different cancer tissues. The expression of HRASLS2 was increased in our cells which may indicate it as a potential tumor suppressor gene. GABA, which was also altered, has also been shown to be involved in the regulation of tumor genesis and growth. After comparing these genes, HRASLS2 and GABBR2 to the online database, we confirmed that these genes showed the same type of expression changes as our cells.

Conclusion: The importance of identifying gene expression signature is to provide an approach for early detection of invasive tumor growth and alternative treatment for patients. Fgd1 protein may modulate the development of cancer through the expression of the identified cancer genes. These genes could potentially identify markers for early invasive behavior and novel therapeutic targets. We predict the change of expression of these genes modulate signaling for transformation from localized to metastatic tumors. This data could potentially be used as a future test to identify patients who may need chemotherapy since they have possessed the FGD1 markers for advanced tumor growth.
NOT A DEATH SENTENCE: PERSPECTIVES OF AFRICAN-AMERICAN WOMEN LIVING WITH LUNG CANCER

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Introduction: Lung cancer is a leading cause of death in the US. With advances in lung cancer screening and early detection, treatment, lung cancer incidence and death rates have declined, resulting in rising numbers of lung cancer survivors. There is limited research on the experiences of African American women with lung cancer and their perspectives on cancer related behavior change. The primary aim of this descriptive study was to explore African American women lung cancer survivors’ preferences for and receptivity to engaging in cancer risk–reducing behavior changes.

Methods: Female African-American lung cancer survivors (n=6) participated in an audio-recorded focus group. The discussion centered on the women’s experiences of receiving the diagnosis of lung cancer; subsequent treatment and symptom management issues, their personal responses to and perspectives on behavioral change recommendations; and personal health promotion practices and preferences. A team of researchers engaged in the analysis of the transcribed focus group data, which involved open and focused coding, followed by the development and interpretation of salient narrative themes.

Results: As cancer survivors, participants verbalized and exemplified the notion that lung cancer is not an automatic death sentence. Through the diagnostic and treatment processes, they had learned to live with the diagnosis and lingering systems and understand recovery. They provided examples of how the lack of timely and adequate information impacted their ability to cope with the recovery process.

Within the group, there was collective recognition that as women of color surviving lung cancer they needed to support each other.

Conclusions: These female lung cancer survivors recalled the many challenges, including persistent symptoms, stigma, and barriers to effective communication with health providers they experienced throughout the diagnostics, treatment, and recovery process. They clearly indicated the desire to learn from and support other African American women diagnosed with lung cancer. The long-term goal of the research is to design and implement interventions to enhance survivorship among this vulnerable and understudied group.

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Category: Clinical Science
DOES GENDER INFLUENCE TRAINEE CONFIDENCE IN THEIR ABILITY TO PERFORM SBIRT SKILLS?
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Abstract
Background: Screening, brief intervention, and referral to treatment (SBIRT) is an evidence-based clinical strategy for addressing at-risk substance use. The University of South Carolina School of Medicine Rehabilitation Counseling Master’s Program, College of Social Work, and College of Nursing customized the SAMSHA SBIRT curriculum for use with graduate students. The result was an innovative project to educate health professionals to use SBIRT to reach South Carolinians who use substances at risky levels.

Methods: Online didactic presentations and hands-on skills practice sessions were developed to ensure fidelity across disciplines. A twenty-five item questionnaire was designed to capture knowledge, attitudes, and skills before and after training. Four items assess confidence in ability to perform the skills essential for SBIRT.

Results: 332 trainees have completed pre-training assessments; 85% of the trainees were female. A logistic regression model, using professional discipline, age, gender, prior experience with patients having drug or alcohol problems, and prior training in substance abuse as predictors, found a difference in pre-training confidence. Paired T tests found the training significantly improved all four confidence items for the women, but only one confidence item for men.

Conclusion: The analyses indicated women self-reported more formal hours of training, however on the pre-assessment surveys women are less confident than men. Following the training, while both genders gained more confidence, the increase for women on one item was significantly higher than for men. Long term research with more trainees will improve our understanding of gender differences.

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Work presented at 9th World Congress on the Promotion of Mental Health & the Prevention of Mental & Behavioural Disorder (September 10, 2015).