

defined as having a baby with birth weight  $\geq 4000$  g or 8 lb or 13 oz, ICD-9 or ICD-10 code for GDM during pregnancy or at delivery, or an oral glucose tolerance test (oGTT) 12–16 weeks before delivery with 2 or more abnormal results by Carpenter and Coustan criteria. We anticipate that our final GDM data set will include 2000–3000 individuals. We will then calculate the percentage of individuals receiving recommended screening tests at 6–12 weeks (fasting glucose or 2 h oGTT) and 1–3 years postpartum (fasting glucose, 2 h oGTT, HbA1C). We will use multivariable regression techniques to identify risk factors for lack of screening. We will be able to incorporate predictors not previously evaluated including distance from home to health center, access to public transport, specialty and training of the patient's providers, pregnancy weight gain, postpartum appointment time of day, and number of various types of office visits. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The creation of a linked data set of pregnancies complicated by GDM in women receiving care in FQHCs in Missouri is the first step toward better characterizing follow-up diabetes screening rates in this population and understanding patient, provider, and healthcare system variables that affect postpartum screening. The ultimate goal is to translate evidence-based patient-centered sustainable interventions into practice for low-income women with a history of GDM and improve population outcomes with the ability to track progress prospectively over time.

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### Decreasing loss to follow up after surgery for meningioma

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**OBJECTIVES/SPECIFIC AIMS:** "Loss to follow up" is a common phenomenon and challenge in clinical medicine. Missed appointments are a well-documented source of waste in the health care system, and can lead to strained patient-physician relationships and inferior quality of care. Meningiomas are relatively common, benign tumors that arise from the dural coverings of the brain. Although complete surgical resection is considered curative, surgically excised meningiomas have a well-documented propensity to recur, necessitating continued imaging surveillance of postresection patients. A recent retrospective study at our institute demonstrated that 20% of postresection patients fail to return for follow up within a year of their surgery. Although social determinants of health have been associated with failure to follow up in this population, there has been no research identifying patient-reported barriers that result in loss to follow up in this patient population. The purpose of this study is to identify specific barriers that prevent patients from returning for surveillance. **METHODS/STUDY POPULATION:** We used an IRB approved, prospective brain tumor clinical database to identify patients who underwent surgical resection of intracranial meningioma at our institution between 2001 and 2013. "Loss to follow up" was defined as failure to attend follow-up appointments with neurosurgery, radiation oncology, or neuro-oncology within a year of the most recent assigned follow-up interval, as recorded in the electronic medical record. Structured interviews were conducted with patients who met study criteria and specific barriers to follow-up were elicited, transcribed, and coded. In 2 cases, a primary caregiver participated in all or portions of the interview with the patient. A general assessment of patient knowledge about meningioma and a screening for basic health literacy were also conducted. **RESULTS/ANTICIPATED RESULTS:** There were 80 patients in the brain tumor clinical database met chart review criteria for inclusion in the study. A total of 9 structured interviews were conducted; 1 interview was excluded from analysis for failure to meet study criteria. In total, 24 unique obstacles to follow up were recorded. These were stratified and grouped into 4 broad categories: 2 of 8 (25%) patients identified environmental factors, including distance to appointment and challenges with insurance coverage as barriers to follow up; 2 patients (25%) identified psychosocial factors, including poor communication with and distrust of their neurosurgeon as barriers to follow up; 2 (25%) patients identified health factors, including poor health and old age, as barriers to follow up; 6 patients identified healthcare systems factors as barriers to follow up, with 6 patients (75%) reporting seeing a non-specialist for follow up after surgery and 4 patients (50%) reporting not being told by their neurosurgeon that they would need continued follow up. Of those patients seen by non-specialists, only 1 reported any recent brain imaging by those providers. All patients had limited to no prior knowledge of meningiomas before their diagnosis. Four (50%) patients reported satisfaction with the level education about meningiomas they received from their physician. Of these patients, 3 (75%) correctly reported that meningiomas may recur following surgery. Of the patients who did not report satisfaction with physician counseling, 3 (75%) did not realize that meningiomas can recur. **DISCUSSION/**

**SIGNIFICANCE OF IMPACT:** Healthcare system factors, including uncoordinated transition of postoperative care to non-neurosurgeons and uncertain postoperative surveillance schedules, represent that most common patient-identified barriers to follow up after meningioma resection. Improving transition of care from specialists to non-specialists, including designation of appropriate imaging surveillance schedules, as well as improving communication between specialists and patients about the need for continued follow up, represent clear points for intervention that could improve care for this patient population. In addition, consistent and clear counseling about meningioma and its disease course may reduce loss to follow up following meningioma resection. It is important to note, however, that the small sample size represents a significant limitation of the study.

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### Incidence and predictors of noncompliance with evidence-based guidelines for early stage breast cancers using the National Cancer Data Base

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**OBJECTIVES/SPECIFIC AIMS:** Evidence-based guideline-concordant care leads to better outcomes in patients with early stage breast cancer, including survival. However, previous studies of guideline compliance have been limited by small study sample sizes, localized geography, unknown causal factors, and lack of diverse population. We use a national database to assess socio-economic, clinical, and facility factors that impact treatment compliance with evidence-based guidelines from the American Society of Clinical Oncology (ASCO) and the National Comprehensive Cancer Network (NCCN). **METHODS/STUDY POPULATION:** This is a retrospective cohort study of the National Cancer Data Base Participant User File Breast 2014, which captures ~70%–80% of all newly diagnosed cancer cases in the United States. Female patients who were diagnosed with early stage breast adenocarcinoma (T0, T1, T1A, T1B, 2, 2A, or T2N1) from 2004 to 2014 were eligible for this study. **RESULTS/ANTICIPATED RESULTS:** A total of 807,314 patients were included in this study. Evidence-based guidelines examined with associated compliance rates include surgery completion (79.3% overall compliance), breast conserving surgery Versus mastectomy (88.05% vs. 11.95%, respectively), radiation after breast conserving surgery (77.5% overall compliance), HER2 testing (88.6% overall compliance), estrogen/progesterone receptor (ER/PR) testing (96.3% overall compliance), hormone treatment for positive ER/PR breast cancer (80.2% overall compliance), and sentinel lymph node biopsy completion (67.5% overall compliance). Univariate association between these guidelines and covariates such as facility type, facility location, age, race, insurance status, median income quartiles, achievement of high school degree, urban Versus rural, Charlson-Deyo score, year of diagnosis, and overall survival were assessed. Logistic regression analysis will be used to determine multivariate relationships between these characteristics and the probability that a patient will be compliant to guideline regimen. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The results of this study will help identify socio-economic, clinical, and facility factors that influence guideline-concordant care and subsequent critical outcomes for patients with early stage breast cancer. Lack of guideline concordant care for specific stages of cancer or treatment modalities will point to a need for tailored interventions to enhance compliance. A prediction model will help identify the most important predictors of noncompliance in breast cancer treatment so noncompliance can be prevented in at-risk populations.

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### Brain thermometry to detect neuroinflammation in traumatic brain injury

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**OBJECTIVES/SPECIFIC AIMS:** In this pilot study, we are testing a new approach for detecting neuroinflammation in individuals who have sustained a traumatic brain injury (TBI). We hypothesize that many long-term adverse consequences of TBI are driven by abnormal inflammatory processes in the brain that occur secondary to the original neural injury. This inflammation can spread well beyond the damaged tissue and cause profound fatigue, widespread pain, cognitive impairment, and depressed mood. **METHODS/STUDY POPULATION:** Using a technique based on magnetic resonance spectroscopy, we can obtain precise and accurate temperature measurements throughout the human brain, which may serve as a proxy for neuroinflammation. In this study, we examine 20 men who have sustained a moderate-to-severe TBI and 10 age-

matched healthy men without history of TBI. Temperature is assessed on a voxel-by-voxel basis throughout the entire brain. Cognitive ability is measured with the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS). Information on pain, fatigue, and mood is collected through questionnaire. **RESULTS/ANTICIPATED RESULTS:** We anticipate that (1) average whole-brain temperature will be significantly higher in the TBI group than the healthy control group; (2) severity of (a) pain, (b) fatigue, and (c) mood symptoms will be correlated with brain temperature; and (3) severity of cognitive impairment will be correlated with brain temperature. **DISCUSSION/SIGNIFICANCE OF IMPACT:** If the hypotheses are confirmed, this tool will fill a need for objective tests of TBI pathology that can be used to improve diagnostic and treatment decisions and predict long-term functioning. This test would be the first completely noninvasive tool for detecting neuroinflammation, and will allow for safe and inexpensive longitudinal testing. Ultimately, we hope this noninvasive scanning technique will accurately track neuroinflammation in TBI, leading to more targeted and effective treatments.

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### A path perspective on bio-psychosocial predictors of health status in peripheral arterial disease

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**OBJECTIVES/SPECIFIC AIMS:** To explore associations among bio-psychosocial factors predictive of overall physical and mental health status as assessed using the SF-12 Health Survey. **METHODS/STUDY POPULATION:** Community-dwelling, male and female elders with peripheral arterial disease (PAD) were administered an assessment battery to identify factors associated with self-assessed physical and mental health status using the SF-12 Health Survey. The battery included an assessment of pain, depressive symptoms, perceived social support, perceived psychological stress, physical function, as well as selected demographic variables. **RESULTS/ANTICIPATED RESULTS:** Preliminary linear regression analyses have identified several factors predictive of physical and mental health status including depressive symptoms, pain, perceived stress, and physical function. A more in-depth examination using path analysis is anticipated to reveal important mediational associations, wherein physical function is a strong mediator between bio-psychosocial factors and overall physical and mental health status. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Aging is often associated with a reduction in physical and mental well-being, frequently exacerbated by the development and progression of chronic disease. PAD is a common chronic condition that places significant burden on the older patient and their family. Identifying and developing a more in-depth understanding of the factors that impact health status in PAD is an important and timely objective. We anticipate that our findings will inform development of more targeted and effective intervention strategies we can employ to improve the quality of life among elders struggling to manage PAD.

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### “A clash of cultures”: Cervical cancer screening and Hispanic males

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**OBJECTIVES/SPECIFIC AIMS:** Focus groups are being conducted to describe and identify barriers and/or facilitators to Hispanic males' health literacy, culture, and language related to cervical cancer prevention practices. **METHODS/STUDY POPULATION:** A purposive convenience sample was recruited to participate in focus group sessions with English or Spanish speaking Hispanic males 21 years of age and older. Groups were segmented by age (21–29, 30–39, 40–49, and 50–65), and language (English or Spanish). Focus group discussions ( $n=8$ ) were led by a bilingual/bicultural female researcher using a discussion guide that followed Zarcado *et al.* (2005) health literacy model 6 as related to their partners' cervical cancer screening and prevention practices. All sessions were audio-recorded and transcribed verbatim. Participants completed standardized questionnaires regarding demographic data and their health literacy. Qualitative content analysis was used for analyzing focus group interviews. **RESULTS/ANTICIPATED RESULTS:** Preliminary qualitative analysis shows the struggle Hispanic males' face accepting cervical cancer screening for their female partners. One participant reported that it was “a clash of cultures.” A “clash of cultures” was described as a constant struggle and acceptance between science, personal knowledge, and Hispanic cultural taboos. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Hispanic male's health literacy, communication, language preferences, and cervical cancer risks, will further enhance the knowledge needed to design intervention measures for cancer prevention among Hispanics. Understanding the factors that contribute

to the unequal burden of cervical cancer incidence and mortality among Hispanic women in South Texas is critical to prevent cervical cancer among this population.

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### Psychosocial risk factors mental health symptoms, and intervention preferences of Latino immigrant parents presenting to a pediatric clinic

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**OBJECTIVES/SPECIFIC AIMS:** (1) To assess the prevalence of mental health symptomatology (depressive symptoms, anxiety symptoms, PTSD symptoms, and problematic alcohol use) and psychosocial risk factors for mental health disorders (low social support, immigration stress, acculturation, and marital/partner discord), and their association with immigration status, health care access and contextual risk factors in Spanish-speaking parents of young children (ages 0–5) who attended a well-child visit. (2) To explore acceptability of screening for and discussing parental distress in the pediatric primary care setting, and parental acceptability of a group well-visit format to address both psychosocial risk factors and mental health symptoms in this population. **METHODS/STUDY POPULATION:** Latino immigrant parents ( $n=100$ ) of children ages 0–5 attending well-child visits at Johns Hopkins Bayview Children's Medical Practice were surveyed between October 2015 and February 2016. The verbally administered survey included the Woman Abuse Screening Tool (WAST), AUDIT-C, Primary Care Post-Traumatic Stress Disorder (PC-PTSD) Screener, California Health Interview Survey (CHIS), National Latino and Asian American Study (NLAAS), Appraisal Support Subscale from Interpersonal Support Evaluation List (ISEL), Personal Health Questionnaire Depression Scale (PHQ-8), and Generalized Anxiety Disorder Scale (GAD-2). These questionnaires have been used in large regional or national surveys and most have been validated with US Latino populations. Positive screens were defined as PHQ-8 > 5 (mild depression or greater), GAD-2 > 3, AUDIT-C > 3 for women and > 4 for men, and PC-PTSD > 3. Descriptive information and comparisons were obtained by  $\chi^2$  and Student *t*-test. Study protocol will allow review of children's pediatric records ( $n=100$ ). From this sample, parents were separately recruited to participate in in-depth interviews ( $n=11$  of 20 planned have been completed) further exploring both sources of parental distress, acceptability of screening for parental mental health symptoms in the primary care pediatric setting, and acceptability of a potential group-based well-visit model in the pediatric setting. **RESULTS/ANTICIPATED RESULTS:** Survey participants were 93.0% women, and predominantly < 35 years of age. The vast majority (94.0%) were undocumented, recently arrived (< 15 years ago) and reported poor or very poor English proficiency (75.0%). Most (84.7%) reported living with a partner or spouse (84.7%), and 58% reported partner relationship strain. In all, 71% reported poor social support. The prevalence of “screen positive” mental health symptoms was highest for depression (55%) and PTSD (35%), followed by anxiety (29%) and alcohol risk use (25%). Having depression was significantly higher (68.4%) ( $p < 0.02$ ) in participants with less education (< 6 grade). Partner relationship strain was associated with a higher prevalence of depressive symptoms (59.3%) ( $p < 0.03$ ). Immigration stress (feeling guilty for leaving family and friends) was also significantly associated with depressive symptoms (58.1%) and PTSD (43.5%) ( $p < 0.03$ ). More than half of the participants (60.0%) with depression were not covered by any health insurance and 56.3% of those with depression reported not having been seen by a health care provider in the past 12 months. A high prevalence of symptoms was found in those with poor appraised social support: alcohol risk use (76.0%), depression (69.1%), anxiety (69.0%), and PTSD (68.6%). Among participants, those aged < 30 years old and those with more children reported poorer appraised social support. Data from child medical records (including BMI, presence of feeding problems, referrals for social work, or mental health services) has been extracted but not yet linked to parent survey or interview results. Preliminary review of In Depth Interviews suggests that the most common reported source of stress among participants was related to finances, followed by documentation/legal status difficulties, access to childcare, and limited English proficiency. Some mothers also mentioned interpersonal violence and lack of access to healthcare as stressors. All mothers expressed an interest in a pediatric primary care based parent focused the majority of which indicated that a group based intervention would be acceptable, some mothers indicated they preferred a one-to-one intervention if mental health were to be discussed. Mothers seem preferential to social worker-led interventions compared with pediatrician-led, but most mothers were indifferent. Finally, mothers expressed low support from the Latino community in Baltimore. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Results from this study suggest that this population of parents is experiencing a relatively high rate of mental health symptoms, low perceived social support, and limited access to their own source of care. This suggests that an intervention delivered within a primary care pediatric setting would have the potential to reach parents who might not otherwise interact with